

The IRON AGE

THOMAS L. KANE

Publisher

o o o

B. H. HAYES
Production Manager

O. L. JOHNSON
Director of Research

o o o

CHARLES T. POST
Manager Circulation and Reader Service

o o o

J. R. HIGHT
Promotion Manager

o o o

Executive Offices
Chestnut and 56th Sts.
Philadelphia 39, Pa., U.S.A.
Editorial and Advertising Offices
100 E. 42nd St., New York 17, N. Y., U.S.A.

o o o

Regional Business Managers

FRED BANNISTER ROBERT F. BLAIR
W. Hartford 7, Conn. Cleveland 14
62 La Salle Road 1016 National City
Bank Bldg.

C. H. OBER PEIRCE LEWIS
H. E. LEONARD Detroit 2
New York 17 103 Pallister Ave.
100 E. 42nd St.

B. L. HERMAN STANLEY J. SMITH
Philadelphia 39 Chicago 3
Chilton Bldg. 1134 Otis Bldg.
J. M. SPACKMAN R. RAYMOND KAY
Pittsburgh 22 Los Angeles 28
814 Park Bldg. 2420 Charamoya Ave.

o o o

One of the Publications
Owned and Published by
CHILTON COMPANY
(Incorporated)

OFFICERS AND DIRECTORS

JOS. S. HILDRETH, President

EVERIT B. TERHUNE Vice-President
P. M. FAHRENDORF Vice-President
THOMAS L. KANE Vice-President
G. C. BUZBY Vice-President
CHARLES J. HEALE Vice-President
WILLIAM H. VALLAR, Treasurer
JOHN BLAIR MOFFETT, Secretary
HARRY V. DUFFY T. W. LIPPERT
D. ALLYN GARBER GEORGE T. HOOK

o o o

GEORGE MAISWINKLE, Asst. Treas.

o o o

Chilton Editorial Board
PAUL WOOTON
Washington Representative

o o o

Member, Audit Bureau of Circulations



o o o

Indexed in the Industrial Arts Index and
the Engineering Index. Published every
Thursday. Subscription Price United
States, its Territories and Canada \$8;
other Western Hemisphere Countries
\$15; Foreign Countries \$25 per year.
Single copy, 35c. Annual Review Num-
ber, \$2.00.

o o o

Cable Address. "Ironage" N. Y.

o o o

Copyright, 1949, by Chilton Company (Inc.)

Vol. 163, No. ²³₂₂

June 9, 1949

Editorial

Inviting Unemployment 43

o o o

Technical Articles

Cast Ferrous Materials for Subzero Service 46
Plating Magnetic Cobalt-Nickel Alloys on Wire 49
Machining Scale Knife Edges and Bearings 50
New Books 54
A Fixture for Continuous Milling 55
Ceramic Society Studies Steelmaking Refractories 56
Talگو Train Makes Use of Alloy Steel Castings 58
Industrial Uses of Radiosotopes 60
Water Cooled Cupolas 61
New Grid Casting Improves Battery Life 62
Flame Beveler Positioning 65
Brazing in Salt Bath Furnaces 66
Weaving Stainless Steel Screening 68
New Equipment 69

o o o

Features

Fatigue Cracks 28
Dear Editor 30
Newsfront 45
Assembly Line 76
Washington 80
West Coast 84
Personals 90
European Letter 94
Industrial News Summary 99
News of Industry 101

o o o

News and Markets

Reject Sheet Market Slips 101
Industrial Briefs 104
Canadian International Fair 105
Barter Plan Aimed at Dollar Shortage 106
Senate Passes Freight Absorption Bill 108
Turnabout in Aluminum Market 113
Machine Tool Developments 138
Nonferrous News and Prices 140
Iron and Steel Scrap News and Prices 143
Comparison of Prices by Week and Year 146
Finished and Semifinished Steel Prices 148
Alloy Steel Prices 149
Pipe and Tubing Prices 150
Warehouse Steel and Pig Iron Prices 151
Ferroalloy Prices 152

o o o

Index to Advertisers 172
Dear Customer 173

KEY FEATURES OF A COMPLETE STEEL SERVICE



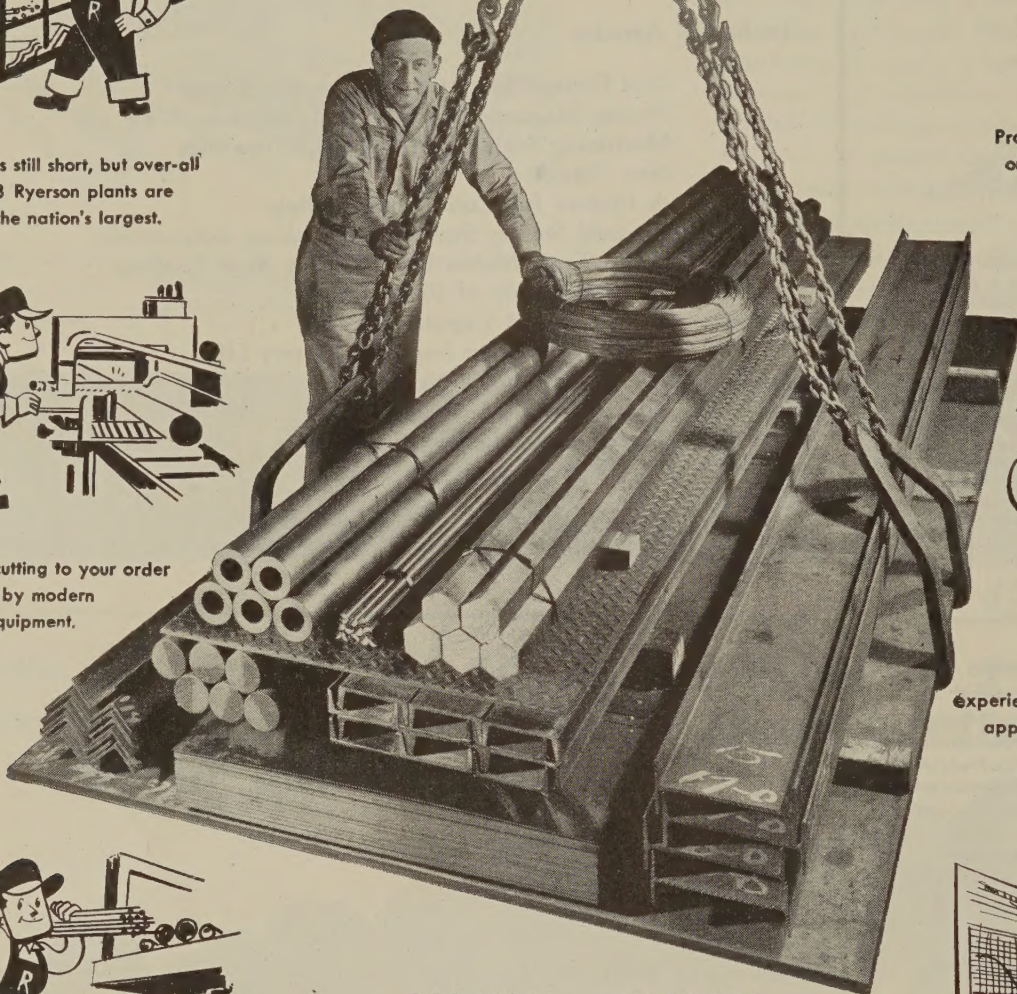
Some types still short, but over-all stocks in 13 Ryerson plants are probably the nation's largest.



Accurate cutting to your order is assured by modern Ryerson equipment.



Prompt personal steel service on all orders, large or small, is a Ryerson tradition.



Over a Century of steel experience means more know-how applied to your steel problems.



You get quick delivery anywhere, because the network of Ryerson plants stretches from coast to coast.



Added Ryerson service includes a chart to guide heat treating sent with alloy shipments.

PRINCIPAL PRODUCTS

BARs—carbon & alloy, hot rolled & cold finished
STRUCTURALS—channels, angles, I & H beams, etc.
PLATES—sheared & U. M., Inland 4-Way Floor Plate, etc.
SHEETS—hot & cold rolled, many types & coatings
TUBING—seamless & welded, mechanical & boiler tubes
STAINLESS—Allegheny metal sheets, plates, bars, tubes, pipe, etc.
REINFORCING—bars & accessories, wire mesh, etc.
BABBITT—and phenolic laminated bearing material
MACHINERY & TOOLS—metal working & boiler shop

RYERSON STEEL

Joseph T. Ryerson & Son, Inc. Plants: New York • Boston • Philadelphia • Detroit • Cincinnati
 Cleveland • Pittsburgh • Buffalo • Chicago • Milwaukee • St. Louis • Los Angeles • San Francisco

100 E. 42nd ST., NEW YORK 17, N. Y.

ESTABLISHED 1855

June 9, 1949

THOMAS L. KANE
Publisher

T. W. LIPPETT
Directing Editor

Editorial Staff

News, Market Editor T. C. CAMPBELL
Technical Editor.....W. A. PHAIR
Metallurgical Editor...E. S. KOPECKI
Machinery Editor.....T. E. LLOYD
Art Editor.....F. J. WINTERS
Ass't News, M'rk'ts Ed. W. V. PACKARD
Associate Editor...H. W. VAN CAMP
Associate Editor....A. D. STOUT, JR.

Contrib. Editor.....J. S. LAWRENCE

Foreign Editors

England (Contrib.)...F. H. HARLEY
54 Priory Way, North Harrow,
Middlesex, England
Canada (Contrib.)...F. SANDERSON
330 Bay St., Toronto, Canada
Paris (Contrib.).....PIERRE BENOIT
59 Rue Manin, Paris XIX, France

Regional News and Technical Editors

G. F. SULLIVAN
Pittsburgh 22
814 Park Bldg.
D. I. BROWN
Chicago 3
1134 Otis Bldg.
JOHN ANTHONY
Philadelphia 39
Chilton Bldg.
EUGENE J. HARDY
KARL RANNELLS
GEORGE H. BAKER
Washington 4
National Press Bldg.
W. A. LLOYD
Cleveland 14
1016 National City Bank Bldg.
W. G. PATTON
Detroit 2
103 Pallister Ave.
OSGOOD MURDOCK
ROBERT T. REINHARDT
1355 Market St., San Francisco 3

Editorial Correspondents

L. C. DEAN
Buffalo
N. LEVENSON
Boston
JOHN C. McCUNE
Birmingham
ROY EDMONDS
St. Louis
JAMES DOUGLAS
Seattle
HERBERT G. KLEIN
Los Angeles

Inviting Unemployment

THERE is one axiom of economics that has withstood the onslaughts of fallacy and the test of time. Demand is never absolute. It always varies inversely with the cost or difficulty of satisfaction. Demand is the consumer's elastic response to buying opportunities.

Every business executive is acutely aware of the impact of this principle upon his sales. The sales manager of an automobile company refers constantly to a master curve showing the potential market for his cars. For every hundred dollar rise in the price of his product he must remove a portion of the potential market. It is not necessary to be a sales executive or a Ph.D. in economics to grasp this principle. The elder Ford successfully tapped a huge and, at the time, unsuspected, market for his cars by making them cheap enough to bring them within the buying power of millions of citizens. It was his ability to cut the cost that created a vast new industry and provided jobs for hundreds of thousands of workers.

The automobile statisticians who predict a continued demand for new cars of not less than 4.1 million per year for the next decade are talking through their hats because their elaborate curves of population, car-age distribution and maximum safe use ignore the price factor. Similarly those students of construction who confidently predicted ten years of million-unit residential construction based on new family formation will find their prediction off the beam because they failed to take into account the impact of price on personal income, buying power and the disposition to spend. It is amazing how "minimum necessary" living space can be shrunk and how other "absolute essentials" can be deferred in the face of declining income or prices which the buyer thinks excessive even though his means are ample.

One of the tragedies of the new wave of industrial unrest which seems on the way is the apparent inability or disinclination of labor leaders to grasp this principle of elastic demand. With a shocking polemic opportunism they are prepared to paralyze production with work stoppage and insist on higher pay even though the cost of living is falling, unemployment increasing and widespread consumer resistance to prevailing prices becoming more evident with each passing day. The fact is that the pipe lines are filled, that urgent demands which disregard price have already been satisfied, that we are entering a period in which consumers have a free choice among many products and can take their time in buying.

These consumers are in no mood to underwrite costly pension schemes and fringe benefits. Whatever merit these increases may have in terms of just compensation for labor the point is that labor leaders are imposing these added costs at a time when business is "on the reverse slope" and heading for lower levels.

Plain arithmetic must show these leaders that there is no margin in corporate profits or executive salaries capable of absorbing, as an example, the 49 cents an hour in fringe demands which Walter Reuther is apparently making to Ford. There is no magic formula by which this added cost can be kept out of the final price of cars. Each finished car is the crystallized end product of so many days' labor. When labor leaders deliberately increase the price they are inviting earlier market saturation and—unemployment.

Joseph Stagg Lawrence

Inland Steel, too, Is Blended to Your "Formula"



JUST as tobacco is individually blended for the particular pipe smoker . . . Inland steel is individually made to your specifications. This service is possible because Inland is a completely integrated producer . . . with centralized facilities that permit prompt decisions and flexible operations. Inland takes a friendly, personal interest in your order. Your steel is checked and rechecked . . . furnished to you *job-fitted* to your specific requirements.

INLAND STEEL CO., 38 S. Dearborn St., Chicago 3, Ill.
Sales Offices: Chicago, Davenport, Detroit, Indianapolis,
Kansas City, Milwaukee, New York, St. Louis, St. Paul.

*. . . and This "Inland Team" Gives Your Steel
Their Personal Attention*

INLAND STEEL

BARS • STRUCTURALS • PLATES
SHEETS • STRIP • TIN PLATE
FLOOR PLATE • PILING • RAILS
TRACK ACCESSORIES



METALLURGY SALES OPERATIONS

June 7, 1949

- ▶ French National Railways are conducting research aimed at equipping certain fast trains with rubber tires. Three such trains have already been ordered. A trial conducted near Bordeaux on May 4 was declared a success, proving smoother and more comfortable for passengers. Train was composed of six aluminum cars. A similar test was conducted before the war by the Michelin rubber company.
- ▶ Three steel mills have placed orders for non-contact X-ray gages which will be used to measure heavy gages up to 3/8 in. This is the practical limiting thickness for hot mill use.
- ▶ Development of jet planes has highlighted potential fuel supply problems. Fuel consumption of the jet plane is more than five times that of its World War II reciprocating engine counterpart. Thus, supplying the same number of planes as in the last war would require not 600,000 bbl of 100 octane gas per day but 3 million bbl per day. This is more than total peacetime demand for all types of gasoline. The alternative would be to develop jet engines which could burn a variety of light petroleum hydrocarbons, thus broadening the scope of fuel supply.
- ▶ Though price concessions are showing up on stainless steel bids for government orders, there is no evidence of price shading in carbon steel---except for export. Stainless base prices are unchanged, but in addition to the usual freight absorption, some waiving of extras is reported.
- ▶ Goteborgs Handel-och Sjöfarts-Tidning reports that the Norwegians are interested in exchanging heavy water for Swedish uranium. Although the Norwegian uranium deposits contain 800 g of uranium per ton of ore, and the Swedish only 200 g per ton, Norway is said to consider it best for both countries if Sweden undertakes the extraction of uranium.
- ▶ Minor over-correction of tinplate inventories has already appeared. Some smaller consumers who reduced orders early this year on the heels of price-cut rumors are discovering they ran them too low. They are buying again. But some big firms are being stalled off by canners waiting for overdue commitments from chain stores.
- ▶ On the basis of recent tests, steel coated with aluminum by a hot dipping process or aluminizing appears to be twice as durable as bare steel for car mufflers and tailpipes. Actual life will be determined by the thickness of the aluminum coating and how well it survives in the welding and other fabrication operations.
- ▶ The Administration is for the St. Lawrence Seaway and hopes to get this project through Congress. There is no reason to believe Mr. Truman would agree to the power development separately if the transportation section seems doomed. At this writing he wants both parts.
- ▶ Canadian steel users last fall committed themselves for large tonnages of high priced British steel. This will not be cancelled. It is now being delivered. Indications are that Canadian firms will have to work off high priced inventories, as U. S. firms have already been doing.
- ▶ Space between key installations is believed by the military to be the best protection against atomic attacks. They urge essential units be separated by at least 3 miles and where feasible new plants be constructed in communities of 50,000 people or less. Because of high cost of atomic warfare, adherence to these plans is expected to provide a reasonable measure of safety in the foreseeable future.
The Navy's Bureau of Ordnance is giving highest priority to projects for improved aviation ordnance, antisubmarine weapons, and antiaircraft weapons. About 85 pct of the bureau's developmental effort is devoted to these three fields.
The Navy's requirements for steel in 1949, including shipbuilding, total approximately 435,000 tons, less than one-half of 1 pct of total production.
- ▶ Even those metal working officials who have privately believed we are in for a sharp dip after midyear because of inventory corrections will be quite shocked when this actually happens. Anticipating bad news doesn't make it easier to take.
But some good will come from corrections in steel. Following corrections, buying can again be based on long term replacement and expansion in consuming industries. The price hurdle will also have to be faced---if not this fall, then sometime next year. Real, basic, normal buying habits will not return until users are sure the price structure has been tested to the maximum.
- ▶ The recent turnabout in the aluminum market has caused producers to actively investigate the possibilities of export. Nearly all ECA aluminum is presently coming from Canada, at prices substantially lower than those prevailing in the U. S.

Cast Ferrous

By JOHN W. JUPPENLATZ

*Chief Metallurgist,
Lebanon Steel Foundry,
Lebanon, Pa.*

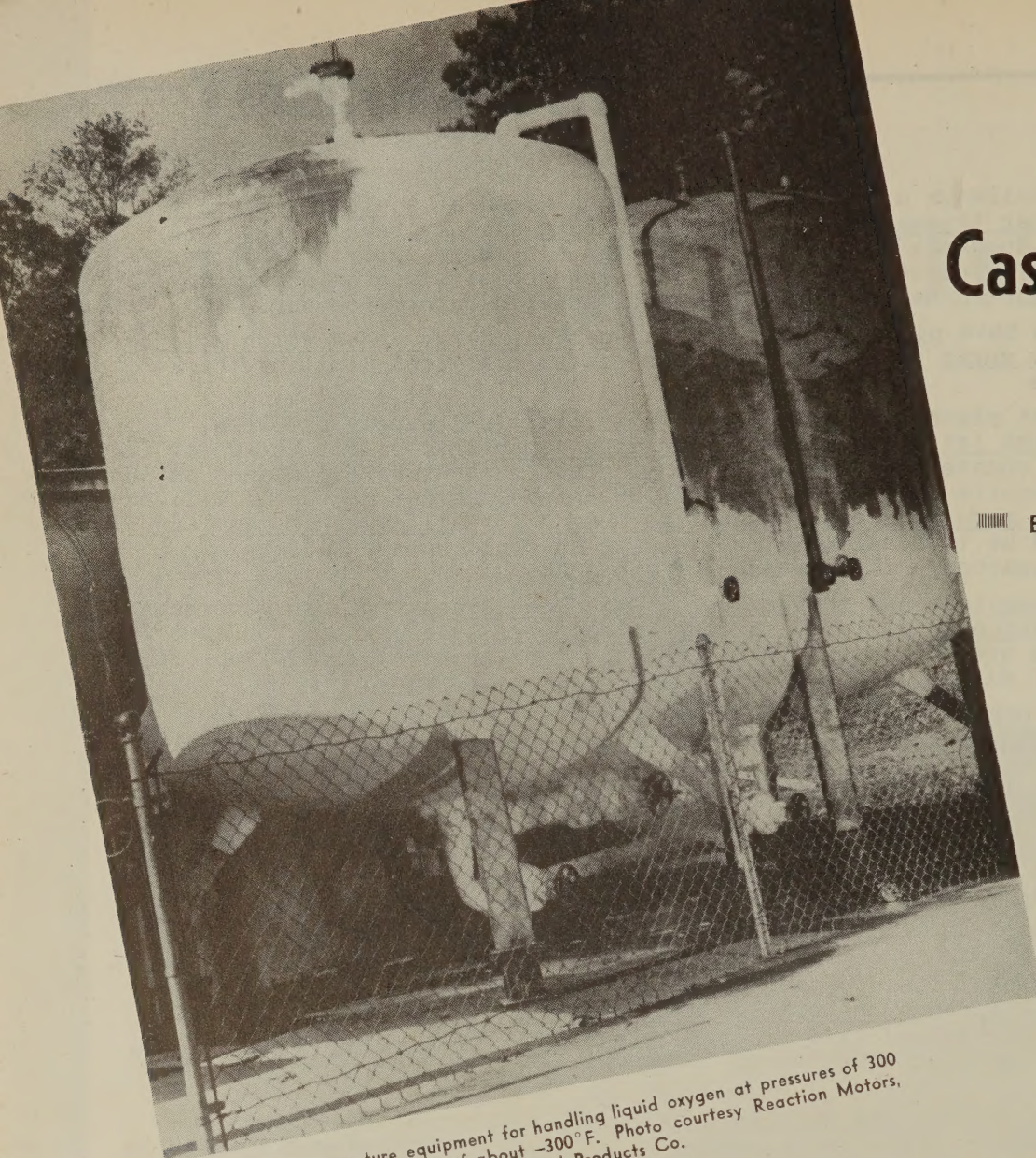


FIG. 1—Low temperature equipment for handling liquid oxygen at pressures of 300 to 500 psi and temperatures of about -300°F . Photo courtesy Reaction Motors, Inc., and Alloy Steel Products Co.

SUBZERO temperatures cause physical changes in either cast or wrought ferrous materials that modify properties commonly understood at room temperatures. The demand for materials of construction for lower temperatures of operation is increasing, due to new developments in the oil, chemical and other processing industries. These low temperature operations require the selection of materials that will successfully perform at subzero operating temperatures. These materials must also be accessible as well as versatile for the different modes of fabrication and construction without the fear of brittle failure causing damage.

A typical illustration of pressure equipment serving at very low temperatures is shown in fig. 1, involving storage facilities of liquid oxygen

under pressures of 300 to 500 psi with a temperature of approximately -298°F . The liquid oxygen is used as a propellant for rocket engines. Control valves were produced by Alloy Steel Products Co., Linden, N. J., from austenitic chromium-nickel castings supplied by Lebanon Steel Foundry. Materials used in construction of equipment to serve under these and similar conditions must possess adequate strength and resistance to embrittlement as caused by the low temperature of operation.

Cast ferrous materials for low temperature service are divided into two major classes; (1) materials commonly known as ferritic, which include carbon and low alloy steels, and (2) austenitic ferrous base alloys of the stainless steel types. Both of these basic types of ferrous castings are suitable for subzero services, with limitations of service temperatures for the ferritic types and virtually unlimited application for the austenitic types.

This article is not intended to cover detailed

Materials for Subzero Service

Low temperature service influences markedly the mechanical properties of both cast and wrought ferrous metals. Comparing, qualitatively, the suitability of ferritic and austenitic steels at various temperature levels, the author also presents data on the effect of temperature on the tensile and impact properties of cast 19-9 stainless steel.

data on low temperature properties of ferrous castings which has been recently published by Russell Franks¹ or the Steel Founders' Society.² It is generally understood that by lowering the temperatures from normal, an increase in tensile strength and hardness results, with a decrease in ductility. Ferritic type materials are subject to embrittlement at some low temperature, and this property is evaluated by impact tests at low temperatures.

In order to preclude the use of brittle metals at low temperatures, present day specifications require that three standard (10 mm square) key-hole impact tests shall show an average minimum impact value of 15 ft-lb. A few specifications for cast ferritic materials have arbitrarily modified the requirements to 10 ft-lb minimum average impact strength, and these castings have adequately performed at subatmospheric temperatures. Nearly complete brittleness is indicated at and below the 5 ft-lb Charpy keyhole level, and these materials are obviously dangerous and unreliable where shock resistance is paramount at subzero temperatures.

Impact tests of cast ferritic materials usually show uniform values at normal temperatures, but a decline of impact resistance is noted when the

temperature is lowered. At some low temperature the impact fracture of ferritic materials rapidly changes from a ductile to brittle fracture with a scatter of impact test results. This is called the transition zone where variables of impact resistance are found.

According to H. W. Gillett and F. T. McGuire,³ "With mixed fractures, that is, anywhere in the transition zone, very wide scatter may occur." This phase of impact evaluation is particularly true with normalized and tempered or annealed grades of cast ferritic materials. These general conditions are graphically represented by fig. 2 when a series of impact tests are made with lowering testing temperatures using the same lot of

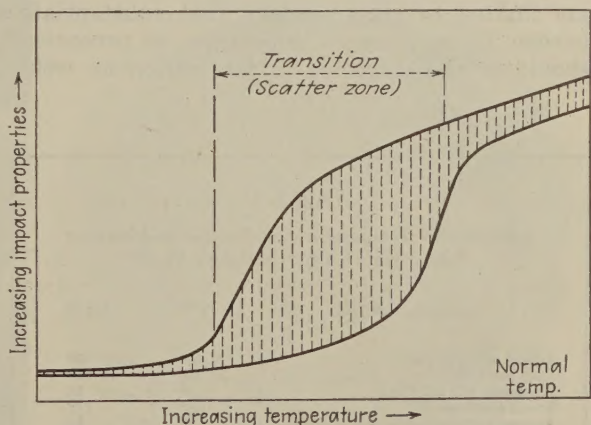


FIG. 2—General effect of temperature on the impact properties of normalized and tempered cast ferritic steels.

¹ Russell Franks, "Properties of Metals at Low Temperature," ASM Handbook, 1948.

² "Low Temperature Impact Strength of Certain Alloy Cast Steels," Steel Founders Society of America, Research Report No. 5.

³ H. W. Gillett and Francis T. McGuire, "Report of Ferritic Steels at Low Temperatures," ASTM, 1945, Part I, p. 17.

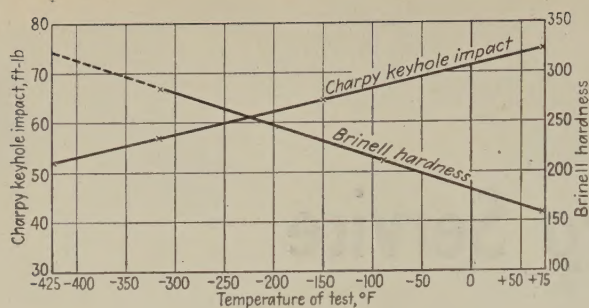


FIG. 3—Average Charpy keyhole impact and Brinell hardness values of Lebanon Grade 22, cast and annealed, at low temperatures. Tests at -423°F were made by M. Fontana, Ohio State University.

ferritic material. Tests at temperatures well within the transition zone may show considerable scatter and relative lack of uniformity. Therefore, the selection of ferritic castings to serve at low temperatures is conservatively limited to those materials having sufficient impact strength and minimum of scatter at the specified low temperature. It should be noted that neither composition nor heat treatment of ferritic materials is positive means of sufficient impact resistance, and check tests of all individual lots is essential to ascertain adequate qualities.

Large tonnages of ferritic, carbon and low alloy types of castings are currently serving at low temperatures. A majority of these castings are believed to be processed by normalizing and tempering. Plain carbon (0.25 C) type ferritic castings in the normalized and tempered condition are generally adequate for service temperatures of 0°F . Lower transition temperatures are expected when small percentages of alloy, such as nickel, are employed, making these low alloys generally applicable to temperatures of about -75°F before scattered impact results are encountered.

Alloyed ferritic materials have further improved low temperature properties when adequately hardened by quenching and tempering heat treatments. In this condition, impact scatter is reduced within the transition zone and adequate impact resistance may be found at temperatures as low as -150°F . These low alloys are limited to mass sections that substantially harden throughout. Components, so processed, should not be subjected to fabrication by weld-

ing after heat treatment, which greatly reduces impact resistance at low temperatures in the heat-affected zones.

Many engineering components are built by fabrication and welding. This may be economically desirable, but welding does not enhance low temperature impact resistance, due primarily to structural changes in the fusion zones. When ferritic cast materials are to be fabricated by welding, the basic components are generally limited to normalized and tempered materials that may be retempered after welding. Fortunately, there are cast ferrous type austenitic materials that are not materially affected by welding, and since these ferrous alloys do not possess a known transition temperature their use at very low temperatures is permitted.

Certain austenitic stainless type alloys do not become embrittled with the lowering of temperature. These austenitic alloys are commercially available in cast or wrought forms that may be used at low temperatures without embrittlement. The cast alloy, containing 19 pct Cr and 9 pct Ni with low carbon, appears to have the best overall properties at low temperatures of the austenitic group.

Fig. 3 shows the average results of several hundred impact tests from production lots of Lebanon Steel Foundry's alloy grade 22, Alloy Casting Institute, Grade CF-8, which is similar in composition to the wrought type AISI-304 stainless alloy. This cast alloy does not show any structural change down to -423°F . There is a proportional decrease of Charpy keyhole impact values, but in no case has any brittleness been found. On this same fig. 3 the average brinell hardness has been plotted from readings taken at several temperatures. The increase in hardness is directly proportional to the decrease in temperature.

The tensile strength of this cast austenitic alloy varies inversely with temperature and in direct relationship with hardness. Ductility is also lowered somewhat, but not in proportion to the increase of tensile strength, which is estimated to be approximately 200,000 psi at -423°F . A typical example of the effect of low temperature on tensile and impact properties is shown in table I.

This austenitic alloy may be easily welded by the electric or gas process without the need for subsequent heat treatment, since low temperatures do not seriously impair the as-welded impact resistance. It is recommended, however, that solution heat treatments be employed where maximum corrosion resistance is a desirable feature. The excellent welding characteristics of the cast alloy and the wrought material equivalents offer the maximum degree of flexibility to the designer and fabricator of equipment for safe operation at extremely low temperatures. No embrittlement from low temperature has been noted in the cast alloy or from the welds or adjacent fusion zones made from the same composition.

This type of cast austenitic alloy, Lebanon grade 22, has not revealed any brittleness to temperatures down to -423°F , nor has any tran-

TABLE I

Influence of Temperature on Tensile and Impact Properties of Cast Stainless Steel*

Temperature of Test	$+70^{\circ}\text{F}$	-320°F
Tensile strength, Psi	73,500	162,000
Yield point, Psi	37,500	79,500
Elongation in 2 in., Pct	59	33
Brinell Hardness No.	146	277
Average keyhole Charpy impact, Ft-lb	82	61

* Chemical composition: 0.07 C, 19.32 Cr, 9.50 Ni.

sition zone been noted in test work covering hundreds of production heats. Impact tests at low temperatures for this grade are often waived due to the high values and consistent uniformity even at the lowest commercial temperatures.

The choice of ferrous cast materials largely depends upon temperature of operation. Ferritic castings can be employed with some limitations

to moderately low temperatures. All ferritic types show a transition zone at some low temperature which becomes the limiting factor in their use. Austenitic cast ferrous alloys of the 19 Cr:9 Ni type do not possess a known transition zone at the lowest available temperatures, and these cast materials may be used under these conditions with confidence.

Plating Magnetic Cobalt-Nickel Alloys on Wire

ELECTROPLATING silicon-bronze wire with an 80 pct Co-20 pct Ni alloy is accomplished in an unusual setup at Brush Development Co., Cleveland. The method involves a special frame on which wire is run through the plating cycle, special Ni-Co anodes of the same composition as the plate and the use of a periodic reverse current system. The wire, because of the exceptional magnetic qualities of the plate, is used in wire recorders, calculating machines and other devices.

Wire is run through the plating bath, on the unit shown in fig. 1, at 135 fpm. It is guided, in a helical path, over two grooved rollers; the upper roller being driven and supplied with current. One anode is arranged inside the wire helix and an outside anode is placed on either side of the frame. In the photograph, the outside anodes have been removed—one of these can be seen in the lower right-hand corner—to better show the unit itself.

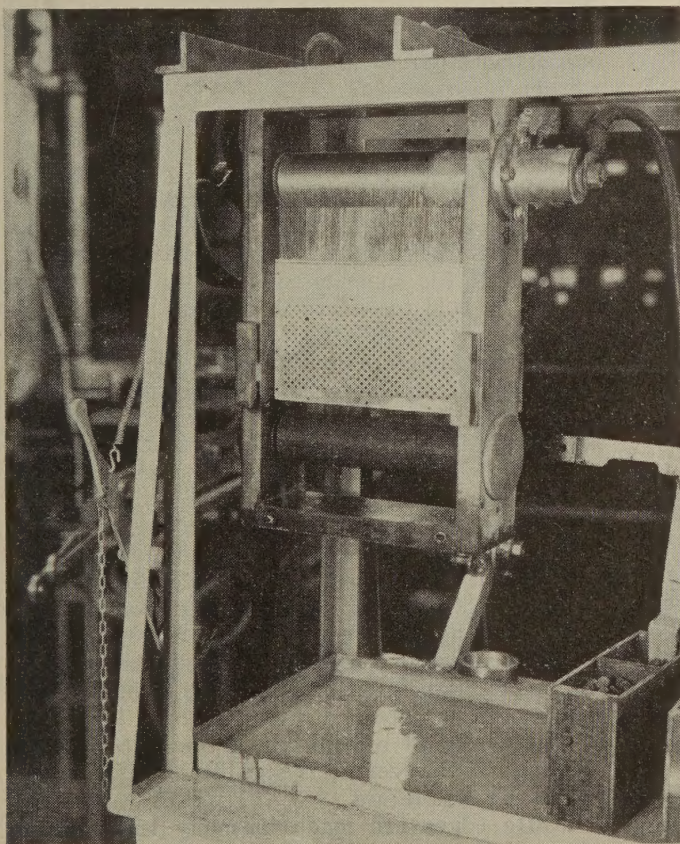
For ease of bath control and uniformity of deposit, special 80 pct Co-20 pct Ni cast bars are used as anodes. The bath is a mixture of

cobalt and nickel sulfates and chlorides, maintained at a pH of about 3 and a temperature of 150°F.

The wire, 0.004 in. diam, is in the plating bath for 3 min, receiving a 0.0003 in. coating. A micrograph of the wire cross-section is shown in fig. 2. The deposit has considerable internal stress, this being primarily responsible for the excellent magnetic properties.

A periodic reverse current method, having ac superimposed on a steady dc current, is used. This system is very simple, requiring only a transformer and rectifier, and has been found to assure the desired magnetic properties and uniformity of the plating.

Special instrument parts requiring a magnetic coating are also plated. The process, developed during the war for the National Defense Research Council, is expected to have increased applications with the further development of calculating machines, automatic inventory-taking machines, automatic ticket sellers and other electrical devices.



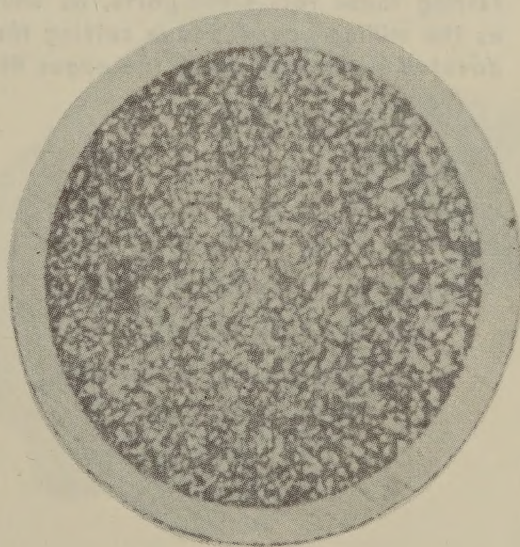
LEFT

FIG. 1—Unit used for wire plating is shown raised above the plating bath. Grooved rollers, one of which is driven and electrified, guide the wire, running at 135 fpm, during the plating cycle.

o o o

BELOW

FIG. 2—Micrograph of the plated wire cross-section. Diameter of the core wire is 0.004 in.



Machining Scale Knife Edges and Bearings

The machining of triangularly shaped scale knife edges involves a number of unusual techniques. This article describes methods used for grinding and testing these tool steel parts, as well as the milling operations in cutting the dovetail seats into which the edges fit.

By O. S. CARLISS

Chief Engineer, Scales Dept.,
Yale & Towne Mfg. Co.,
Philadelphia

PRODUCTION and application of scale knife edges and the bearings on which they rest require care if precise weighing is to be done by the scales using these parts. Levers holding the knife edges generally appear rather rough as they require little or no machine work except at the critical pivot points. Unless the edges and bearings are properly made, applied and spaced, however, acceptable weighing standards are not attained.

These considerations governed the selection and arrangement of facilities at this Yale & Towne plant, where Load King dial scales are produced, for producing the components of Load King dial scales. Both knife edges and their bearings are usually made from Carpenter Steel Co.'s Stentor oil hardening tool steel, which is purchased drawn quite close to size. Although some stainless steel is used where scales are to be employed in highly corrosive atmospheres, such knife edges are not generally recommended for other uses because desired sensitivity is not retained as long as for tool steel. The tool steel is hardened to 62 to 63 RC as against 53 to 55 RC for stainless steel.

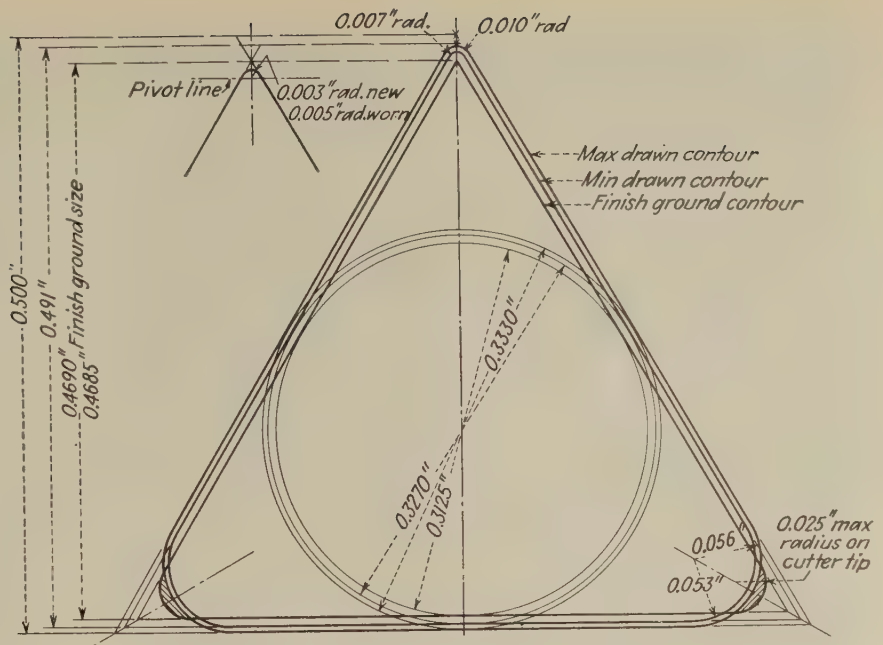
Most knife edges are made in equilateral triangular section, as shown in fig. 1, but the base corner are rounded. Two base corners remain rounded after heat treating and grinding but grinding makes the edge opposite to the seat sharp. All face grinding is done in a magnetic fixture, fig. 2. The final grind on the seat face, in a Blanchard grinder, is critical as this grind determines the distance from the base or mounting face to the opposite edge and this dimension has to be held to within 0.0005 in., as fig. 1 indicates.

Although surface grinding on the two other faces produces a sharp edge at the apex opposite the base, this edge is given a radius of 0.003 in. as shown in fig. 1 by using a yielding rubber abrasive wheel. A yielding wheel applied in this way tends to present a minimum area to the work and, as the minimum area is part of a cylindrical surface, the surface produced is an element of a cylinder having a definite radius. The actual radius is checked by optical projection and is held between 0.002 and 0.003 in.

Thus, although the edge is termed a knife edge, it is not actually sharp. When the rounded edge bears on a surface and moves, as on a lever, the motion is one of rocking about the center of the radius and this center is significant in applying knife edges to levers.

Knife edges are made in many lengths and

FIG. 1—Section of a triangular knife edge. The inner line represents the contour after finish grinding the flat faces. This leaves a sharp apex that is subsequently ground to a small radius.



BELOW

FIG. 3—Ends of some knife edges are brought to a point, as shown here. Since the point is in line with the edge, friction is not introduced if the point contacts a shoulder.

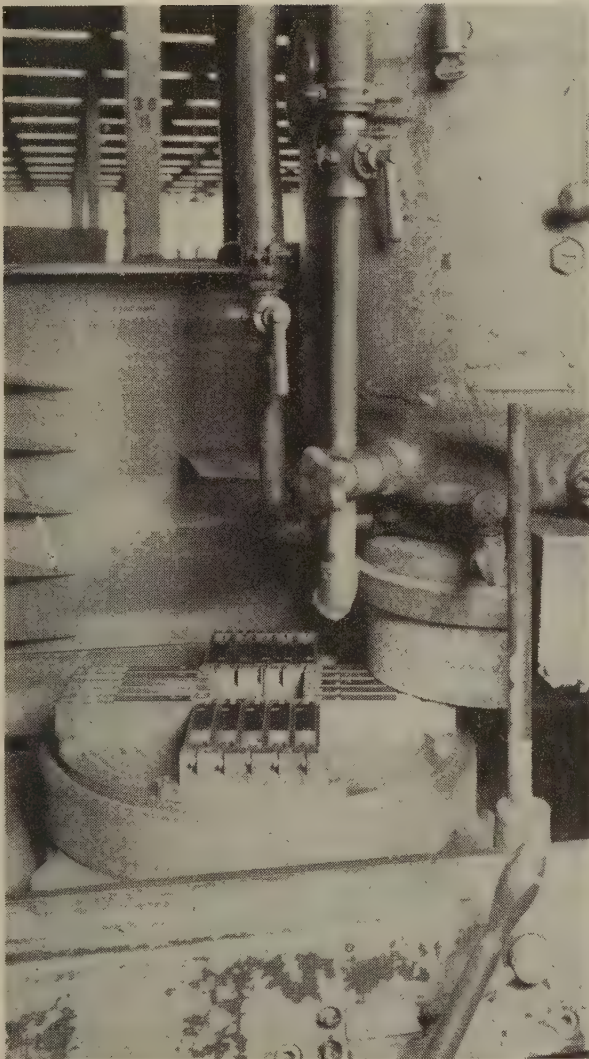
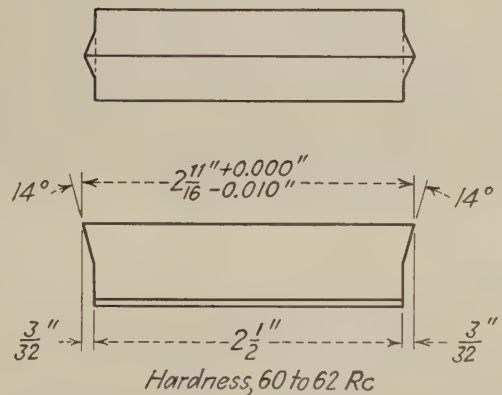
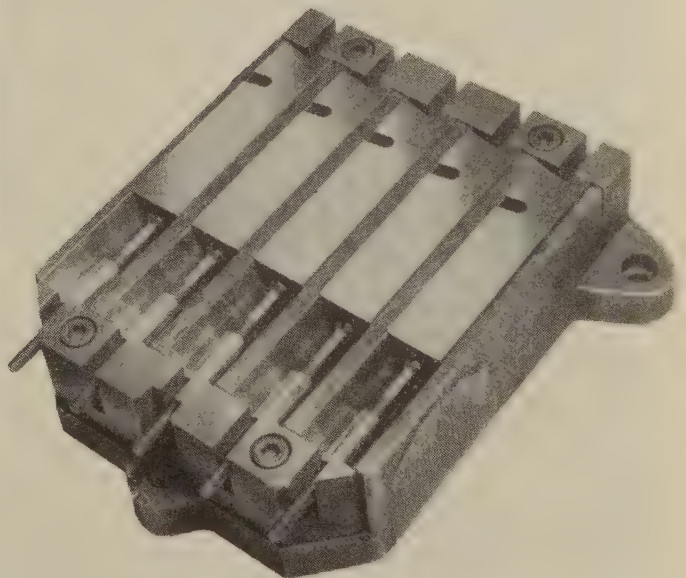


FIG. 2—The fixture at right is one of the four shown in the machine, above. The fixture holds the knife edges in slots while one face is lapped to a 60° angle to the other faces.



ends of the pieces cut from bars before tempering are either left square or are given a point, as in fig. 3, the apex being on the knife edge. This point is provided in cases where the lever containing the knife edge may shift laterally. The point, in such a shift, strikes a hardened plate.

Bearings for knife edges are merely V-blocks having a 120° angle in the corner of which there is a small radius. These blocks are also made from oil hardening steel of the same type used in knife edges and are cut to length before tempering. A primary consideration in grinding is to produce the radius at the bottom of the V.

This radius is 0.005 to 0.010 in. and is produced by the edge of the grinding wheel, dressed to a 120° angle. Dressing makes the edge sharp, but it is immediately rounded by cutting contact

method of measuring the distance between lines. The final check is accomplished by test weighing.

Knife edges having equilateral triangular section, except for rounded corners, press fit in dovetail slots. This insures secure anchorage. The trick is to cut and locate the slots correctly. Fig. 4 shows a typical main lever used in Yale scales. In this lever, five knife edges must be inserted in correct locations. The lever is a flat strip steel weldment. The two pairs of knife edges, marked pivots on the drawing, must be parallel with each other and with the single knife edge at the outer end. Knife edges of each pair must be precisely in line. The spacings or center distances are of great importance.

To machine the dovetail slots into which the knife edges are pressed, a special 5-spindle milling machine, fig. 5, is used. The lever is clamped

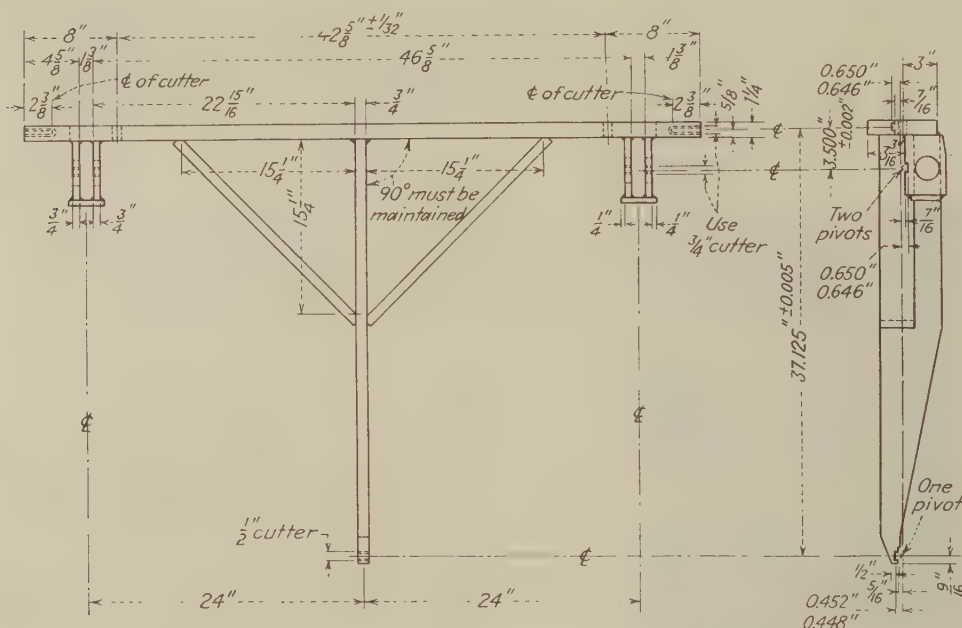


FIG. 4—This drawing of a typical main lever shows the location of five dovetail seats that have to be milled to receive knife edges that are pressed into place.

with the work. The actual radius produced on the work depends upon the wear of the wheel and this wear is proportional to the length of groove cut.

As the precise radius is not extremely critical and is not easily measured as grinding proceeds, the shop is instructed to dress the wheel to a sharp edge after grinding a certain number of bearing blocks, which are aligned and clamped end to end in the fixture. If two blocks of a given length are ground after dressing the wheel sharp, a given radius is known to result and, if the number is increased, a larger radius is produced because the wheel edge becomes rounded more. Thus, as experience has shown that a given radius is obtained in grinding a given number of blocks, it is necessary only to specify the number to obtain a radius within required limits. This is the simple way of getting the desired results. Grinding conditions, such as type, size and speed of wheel, are kept substantially constant.

Although the methods used in making knife edges are important, these pivots will not yield and hold the required precision in weighing scales unless the knife edges are properly located and held. Off hand it may seem an easy matter to insure correct location, but there is no precise

to the table, arranged for horizontal traverse in both directions. Rotary cutters are ground to the required angle. Each spindle has its own individual motor drive. Spindles are set to correct height by using a dial type height gage, and all distances are measured from the top face of the table to the OD of the cutter holder. Holders are set initially concentric with the hollow spindles, all of which are horizontal and adjustable for height by a hand screw.

A machined knee brace, whose base has a key fitting a true longitudinal slot in the table, has a vertical face that is used as a reference surface in setting the ends of cutters so that they will cut slots of specified depth. The width of slot cannot be equal to cutter diameter, as this would afford no clearance. Consequently, cutters are made smaller in diameter and are set just enough eccentric to yield slots of specified width.

To facilitate setting, the cutter holder is made the same diameter as the spindle quill and is set off center by tapping the holder up or down until the required eccentricity is attained. Then the holder is locked.

As the lever's shape does not permit all cuts to be made by traversing the table in one direction only, three cuts are made with the table

o o o

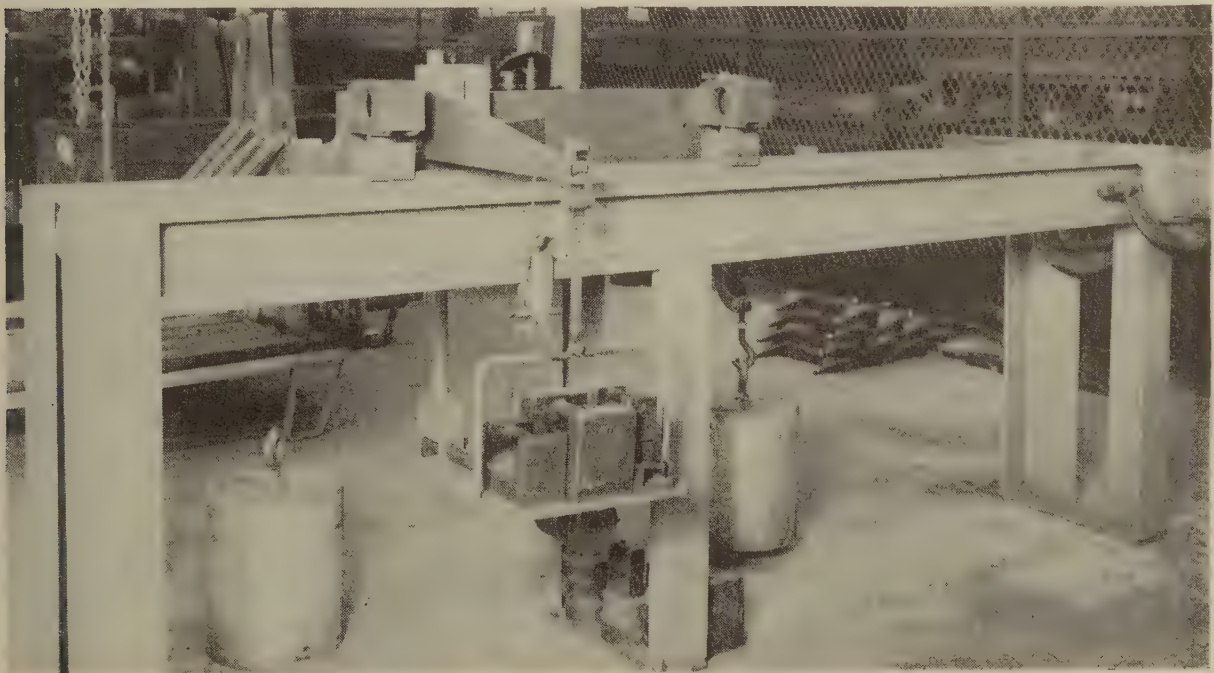
RIGHT

FIG. 5—A special milling machine having five horizontal spindles that are adjusted in various positions is used to cut dovetail slots for knife edges in scale levers of different designs.

o o o



FIG. 6—This rigid frame is employed with check weights to make certain the knife edges are properly spaced. If the lever arm ratio is 10 to 1, a 50-lb weight on the long arm in the front will balance a 500-lb weight on the arm at the rear. If a balance is not attained, the knife edges are not correctly spaced.



motion in one direction and two by table motion in the reverse direction. It has been found that if all cutters turn in the same direction, location of cuts will vary. Consequently three cutters turn clockwise and two counter-clockwise. This makes the cutters tend to pull down and results in closer location of cuts.

Although care is used by the experienced men who make these setups, all levers are checked after milling to make certain that required results are obtained. This is done not by measurements but by weighing. In the case of the lever in fig. 5 and by similar setups for other levers, the lever is set in a rigid frame in which it rests on the intermediate pair of knife edges. A counterbalance is applied and adjusted so that the lever itself is in perfect balance. This is shown in fig. 6.

Next, a known check weight, 500 lb in fig. 6, is hung from one of the knife edges nearest the

pair supporting the lever and a smaller known check weight is hung from the single knife edge at the outer end of the lever. If the lever arm ratio is supposed to be 10:1 and is correct, the smaller weight will be 50 lb and the lever will balance perfectly. If balance is not obtained by this means, the knife edge spacing is not correct and must be altered by an amount that can be figured after applying a known extra weight to effect the balance. This enables the machine operator to shift one cutter just enough to correct the spacing and obtain a balance.

The same weighing setup is used to determine whether the two pairs of knife edges lie parallel. This is done in the case cited by shifting the 500-lb weight from the knife edge at one end to the corresponding one at the other end. If the lever remains in balance, the edges are parallel. If not, they are not parallel and a correction is required in the machining.

... NEW BOOKS ...

"Motion and Time Study," by R. M. Barnes.

Book explains the benefits to be derived from a motion and time study program and describes methods for setting up and carrying through such a program. Motion study, method standardization, time study and operator training are covered. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. \$5.00. 559 p.

* * *

"A Professional Guide for Junior Engineers," by

W. E. Wickenden, edited and collated by G. R. Henninger. Philosophy and engineering ethics necessary for success in the engineering field are discussed in this booklet. Legal registration for engineers and other information on the general position of the profession is covered. Engineers' Council for Professional Development, 29 W. 39 St., New York 18. \$1.00, discounts on quantity orders. 55 p.

* * *

"Indentation Hardness Testing," by V. E. Ly-

saght. Problems involved in the hardness testing of metals and other materials, and evaluation of the advantages and disadvantages of the various methods used are discussed in this book. Recent advances in the field are covered in detail. Reinhold Publishing Corp., 330 W. 42 St., New York 18. \$5.50. 288 p.

* * *

"Photography in Engineering," by C. H. S. Tup-

holme. Industrial and engineering uses for photography are reviewed from the standpoint of the solution of production problems. High-speed photography, X-ray and electron diffraction, microradiography, infrared photography, and other subjects are covered and an index of instructional motion pictures is included. Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2. \$6.50. 276 p.

* * *

"Making Conference Programs Work," by M. F.

Stigers. Conference leadership and the use of

conference programs are discussed in book. Reports of actual conferences are included as illustrative material. McGraw-Hill Book Co., 330 W. 42 St., New York 18. \$3.50. 256 p.

* * *

"Plastics in Engineering," by John Delmonte.

Third edition of this text covers the properties and applications of all types of plastic materials. Methods of molding and fabricating, characteristics of types of mold construction and other subjects are discussed. Penton Publishing Co., Penton Bldg., Cleveland 13. \$10.00. 656 p.

* * *

"Welding Metallurgy—Iron and Steel," by O. H.

Henry and G. E. Claussen, revised by G. E. Linnert. Second edition of this text covers welding metallurgy of specific materials and the effects of different elements. This new edition includes information on processes which have been introduced recently and contains additional information on the metallurgy of specific materials such as the stainless, heat-resisting and stainless-clad steels. American Welding Society, 33 W. 39 St., New York 18. \$2.50. 505 p.

* * *

"Trolley Conveyers," by Sidney Reibel. Informa-

tion on overhead trolley conveyers and systems using trolley conveyers is given in this book. Effective design of conveyers, how to plan vertical and horizontal bends, data on high temperature usage, statistics on chain strengths and sizes, and other detailed information is included. McGraw-Hill Book Co., 330 W. 42 St., New York 18. \$4.00. 265 p.

* * *

"Standard Welding Terms and Their Definitions."

Manual, containing more than 500 terms, defines basic welding concepts and is intended as an aid in the promotion of clarity in welding terminology. American Welding Society, 33 W. 39 St., New York 18. \$1.00.

A Fixture for Continuous Milling

IN designing milling fixtures, the nonproductive time should be as low a part of the total cycle time as practical. In the well designed tool, there are used quick acting features to locate and hold the workpiece wherever possible.

If a milling fixture can be designed on which the cutter is operating and removing material all the time such a tool would be the acme of efficiency. For one job, a milling fixture was designed that almost meets such conditions, as the only nonmachining time is the interval when the milling cutter moves from one workpiece to the next casting.

This fixture was designed for machining a cast iron machine part known as a traverse frame dog segment. The first operations in its production, are milling various bosses and drilling and reaming the several holes. Special production tools are used when performing these operations.

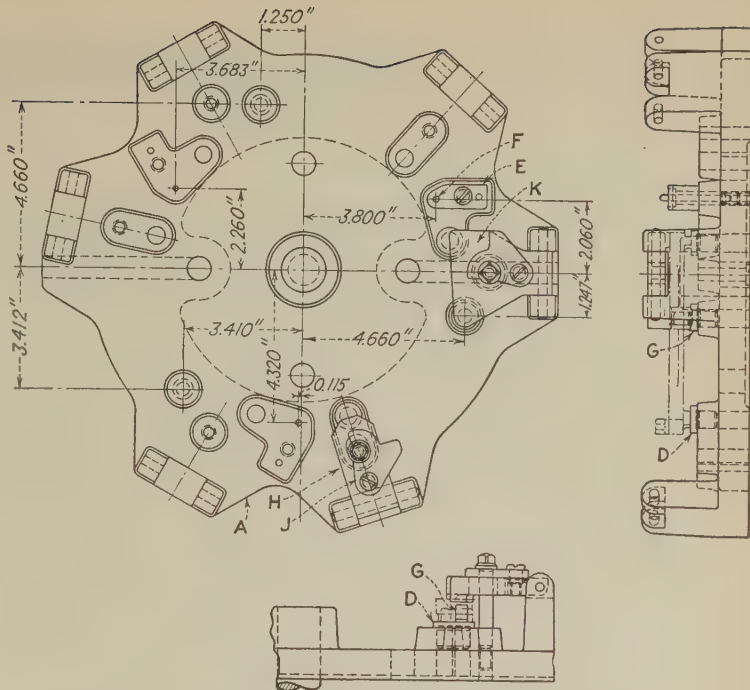
The next operation is milling a V slot on the inner face of the piece. This slot must be accurate both in position and shape, and the fixture used for this work is shown in fig. 1. The fixture is made with a cast iron base finished on the surfaces *f*. When machining the bottom surface of the base two tongues, *B*, are formed to good fit in a slot on the machine table where the operation is performed. Through the base are drilled four holes for bolts to hold the fixture on the machine table.

In a boss on the fixture base is drilled and reamed a hole in which is placed a steel pin, *C*, machined to be a good sliding fit in a hole in the center of the milling machine table. Three holes spaced 120° apart are also drilled and reamed for the tool steel rest pins, *D*. On three machined bosses at 120° increments are attached, each with a filister head screw and a dowel pin, steel blocks, *E*, and in each of the blocks is placed a tool steel pin, *F*, machined with its projecting surface to be a good fit in the No. 10-32 tapped hole in the workpiece.

Three holes spaced 120° apart are machined in bosses on the base, in which are driven tool steel pins, *G*, that are machined with a shoulder on which the workpiece rests and the projecting portion to be a good sliding fit in the 0.3745 to 0.3755 in. reamed hole in the workpieces. Between machined ears on the fixture base are located three steel clamps, *H*, that can rotate on hinge pins placed through a hole in the clamp and two holes in the two ears on the base.

In each clamp is drilled a hole large enough to permit a square headed set screw to pass through which is threaded into the fixture base. On each clamp is attached, with a shouldered filister head screw, a machine steel washer, *J*. These washers have a slot on their side so they can be swung under the head of the set screw.

The fixture is also provided with other three machine steel clamps, *K*, that are somewhat similar in construction to the clamps noted, the difference being that the *H* clamps only contact one surface of the workpiece while the *K* clamps contact two surfaces. The washers used with the



latter clamps and method in which they are used are similar washers labeled *J*.

To use the milling fixture, it is positioned on a rotating circular milling machine table by placing the locating pin, *C*, in a machined hole in the center of the table and the two keys or lugs, *B*, fit into one of the table slots. Nuts are then tightened on four T-headed bolts, placed in table slots and through the four holes in the fixture base. These hold the fixture securely in position.

The clamps, *H* and *K*, are then swung back into their open position, after the washers have been rotated from under the heads of their respective square headed set screws. Three workpieces are now placed in the fixture, being located by the pins, *F* and *G*, and resting on the head of the three pins, *D*. The clamps are then closed, and the washers are rotated under their respective set screws which are then tightened onto the clamps to hold the workpieces securely for the machining operation.

When the correct form of milling cutter has been accurately positioned, which is on the vertical center line and on the inner face of the workpieces, the milling machine is started in operation and as the milling machine table is rotated, carrying a workpiece past the revolving cutter, the groove in the workpiece is milled.

After the machined workpiece has been rotated by the table to a convenient position the clamps holding this piece can be swung back and the workpiece removed and substituted with a casting for the operation. The two clamps are tightened to hold the workpiece ready to be rotated to its machining position.

This fixture is therefore practically a continuous milling tool the only nonproductive time being the short period between one casting and the next workpiece fastened on the fixture. The fixture locates the workpieces accurately and also holds them securely. Also the pieces can be placed into position or removed from the fixture quickly, by means of the open side washers and swinging clamps, so that by use of this fixture the operation may well be considered to be a continuous process.

Ceramic Society Studies

THE 51st annual convention of the American Ceramic Society, held in Cincinnati, April 24 through 28, included 147 papers in such diversified, yet related, ceramic fields as design, porcelain enamel, glass, materials and equipment, structural clay products, whitewares, physical chemistry and refractories.

The refractories division included the papers of most importance to metallurgists for both production and research activities, and abstracts of several of these papers are reviewed briefly herein.

In a paper on "The Chemistry of Chrome-Magnesite Roof Brick During Service," by T. F. Berry, W. C. Allen, and R. B. Snow, U. S. Steel Corp. research laboratory, Kearney, N. J., petrographic and chemical studies of Rytex type brick, taken from all-basic roofs, were described. The bricks studied were typical unfired, metal-encased 40 pct magnesite 60 pct chrome compositions, after 324 and 14 heats in crowns and 50 heats in an end-wall.

Chemical analysis of the 324-heat brick showed that the silica content was highest in a zone just behind the hot face where the silicate bond had apparently migrated from the hot end. The magnesia content varied from 23 to 44 pct from hot to cold ends. In the same direction, alumina varied from 9.06 to 18.8 pct, chrome from 13.22 to 20.30 pct; the iron oxide varied from 44.34 to 8.86 pct in the middle of the brick and remained about 9 pct in the rest of the colder portion of the brick. In addition, it was found that MnO and CaO were higher in the hot face than in the rest of the brick.

The physical dimensions of the brick had also changed considerably. In the first two hot zones only about 65 pct of the original volume was still present; the next two zones were about 85 pct retained, and the outer two zones showed 95 and 100 pct, respectively. Much of the loss is apparently due to growth of the steel encasement on each brick which oxidizes and grows to three times its original thickness. On the entire roof, this growth amounts to 8 in., which must be accommodated by the springs, or else will cause spalling type of failure due to compression.

Petrographic studies of the bricks were in good agreement with the chemical analysis mentioned above. In the hot face a thin peely structure was found to contain large periclase and complex spinel crystals, hematite, and about 75 pct iron oxide. It is considered that the primary cause of the peeling are the large periclase crystals and that an alumina addition would help to prevent this by forming spinel.

In general, iron pickup is the primary cause of brick failures. Some magnesia-ferrite precipitate was even found in the cooler parts of the brick. The iron is considered to be tied in with

magnesia; silica, and calcia sometimes as FeO but most commonly as Fe_2O_3 . The ratio between these two oxides of iron ran as high as 1:150, respectively.

The bonds within and between the bricks were also discussed. Within the brick the chemical bond at the cold end remains sufficiently strong while the ceramic bond at the hot end is being developed at high temperatures.

A new variation of the hot load test for refractory brick was described by Paul G. Herold in a paper co-authored by Christian Knudsen, both of Missouri School of Mines. The paper, entitled, "A Test Method for Measuring the Flow in Refractory Materials at High Temperatures," described a faster test which will also produce test values on super refractories that do not yield much under ordinary tests.

The usual ASTM C16-41 specifications call for a 4½-hr test run on full brick, while the European test, DIN 10-64, using small cylinders, often takes 30 or more hours, as it calls for a 20 pct subsidence of height under constant load and increasing temperature. This new variation of the test utilizes a constant temperature but an increasing load, at the rate of 3 1/3 lb per min. The furnace is a bottom loading type with an air-operated piston to apply the load through silicon carbide blocks to the test brick. In studies on the effect of PCE on load test strength, little variation was found. The variations in PCE were from 32 to 34 and only about 1 pct difference in subsidence was found.

Larger differences were found, however, when the PCE was constant and the porosity varied. A variation between 10 and 15 pct values of porosity gave 4 pct variation in shrinkage under hot load. In a comparison of forming techniques the stiff mud brick, in spite of laminations, stood up better than the dry pressed specimens.

In addition to the tests of bricks, two open-hearth ladle nozzles were run at 2280°F. The rounded ends of the nozzles were cut off before testing. One was a cone 28 nozzle and the other a cone 16 nozzle, of which the latter had much lower load resistance than the cone 28 specimen.

"Refractory Castables, Preparation and Some Properties" by R. A. Heindl and Z. A. Post of the National Bureau of Standards, presented a progress report on tests on two calcium aluminate cements with two types of grog at room temperature. Further work at elevated temperatures is planned.

In this study, one cement was imported and one was domestic (Lumnite) while one grog was unused, clean, crushed firebrick and the other calcined Kentucky Flint fireclay. These were crushed and sized into three fractions ⅜ in. to 10 mesh, 10 to 40 mesh, and -40 mesh. The best packing mixture was determined on a triaxial diagram basis by using a graduated cylinder,

Steelmaking Refractories

containing a definite weight of material, which was bounced $\frac{3}{4}$ in. on a rubber mat to obtain the least volume for each mix. This was repeated, including the cement additions, and it was found that considerable leeway in grog sizes is permissible as long as the amount of cement is held constant.

The imported cement was found to have slightly more smaller particles and therefore a much greater surface area. The cements were added in increments of 5 pct between 10 and 30 pct to the grogs for PCE tests. In these tests more than 15 to 20 pct of cement was found to be markedly detrimental to the PCE of 32 to 33 and 34 to 35 for the fireclay brick grog and flint clay grog respectively.

The compressive strength was used as the main criteria for evaluating mixtures and processing steps in the major portion of this work. Mixtures contained 10, 15, 20, 25, 30, and 35 pct cement; however, the most work was on the 25 pct cement mixtures. Various treatments after forming were tried but two of the most important steps which affect the final product were mixing time and water temperature. Optimum mixing was found in dry mixing 1 min, then wet mixing 2 min. The water should be around 59°F for best results because of the change in the cement during setting from hexagonal to cubic crystal structure. In studying the cement:water ratio v. compressive strength, the best strength was found when the ratio was in the range 1.65:1.85, with the curing in a wet box rather than a dryer. Either more or less water than that specified produced weaker bodies.

To better simulate industrial conditions the mixing and forming time were lengthened. Tests indicated that initial compressive strengths could run around 3500 psi, but after 30 min they would level out to about 4000 to 5000 psi.

The best curing conditions are found to be 24 hr in 100 pct humidity, 24 hr of water soak, and 24 hr at 53 pct humidity. Under these conditions good strength could be obtained with as little as 10 pct cement and in some cases strengths as high as 10,000 psi were obtained. Heating and drying the mixtures during curing caused a 50 pct loss of strength in many cases.

T. S. Shevlin and A. R. Blackburn of Ohio State University presented the fourth in a series of papers on cermets, entitled, "Equipment for Developing and Testing Cermet Solid Bodies." The first three papers concerning early equipment and reactions of metals and oxides were presented at the 50th annual convention (see THE IRON AGE, July 8, 1948).

The continued work on these combinations of metal powders and oxides, such as chromium and alumina, to obtain thermal shock resistant, refractory, high strength bodies requires that additional special equipment also be developed.

Equipment described in this paper includes: (1) a molybdenum-wound furnace for firing in inert atmospheres to 3300°F, (2) a diamond-wheel grinding machine, (3) a description of the changes in a previously described tensile test machine, and (4) a telescopic type of thermal expansion apparatus.

The furnace has a 6-in. diam Alundum tube with 86 ft of 0.080 in. molybdenum wire wrapped around it and spaced so that with radiation shields at each end, the temperature is within 5°F over the central 20 in. of length.

In preparing tensile specimens, a modified lathe is used with a 7 in. diamond grinding wheel to prepare the hydrostatically pressed rods which are $\frac{3}{8}$ in. diam. and 10 in. long. The rods are necked down in the center on a 4 11/16 in. radius to give a $\frac{1}{4}$ in. min diam.

The tensile test machined as previously described used pneumatic cylinders to load the specimen; however this has been changed to utilize a cable loaded lever system. The thermal expansion apparatus is of a well-known type built to hold three $\frac{3}{4}$ in. long bars lying horizontally in a 1-in. diam tube, 25 in. long, heated by electrical resistance elements of the silicon carbide type. The type has two cross holes, 4 in. apart, for observing the specimen through telescopes.

While iron oxides are often the cause of much difficulty with refractory linings in metallurgical furnaces, carbon deposition is often associated with it. The development of bricks with suitable density to minimize these depositions and consequent disintegration was started in 1920 with remarkable results. The production of blast furnaces between relinings rose from 200,000 to 500,000 to 1 million tons of iron, with recent linings yielding 2 million tons.

With the development of better refractories the test apparatus for evaluating them also had to be improved. Early tests took 5 to 6 weeks at 840° to 870°F to cause failure in the bricks. A 120-hr test was then developed which has been subsequently replaced by a 40-hr test of greater severity. This latter test was the subject of a paper by J. A. Shea of the Carnegie-Illinois Steel Corp. entitled "Gary Steel Works Disintegration Test Equipment."

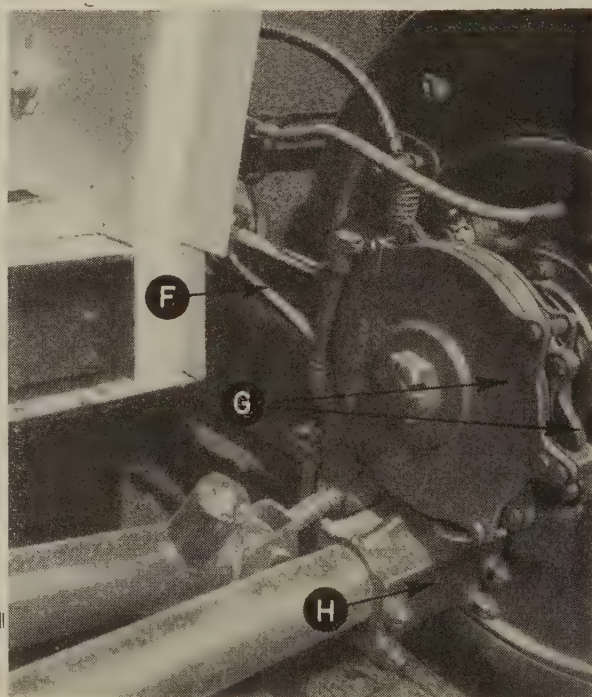
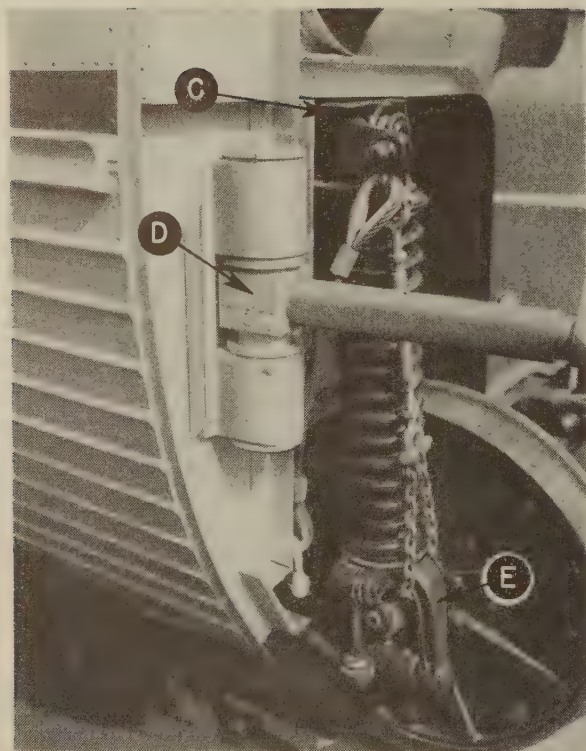
Development of the test started in 1942 and, while successful, is already outdated for not being severe enough. The apparatus consists of a brass test chamber which holds 50 3x3x4 in. specimens for heating in a Cyclone vertical gas-fired furnace. The carbonaceous gas atmosphere is derived from commercial tanks of carbon monoxide which is passed through a mercury bubbler, absorption, drying and safety tubes, a flow meter and a pressure gage. After passing through the test chamber, the gases are cooled and filtered through glass wool for recirculation by a combination vacuum-pressure pump.

Talgo Train Makes Extensive

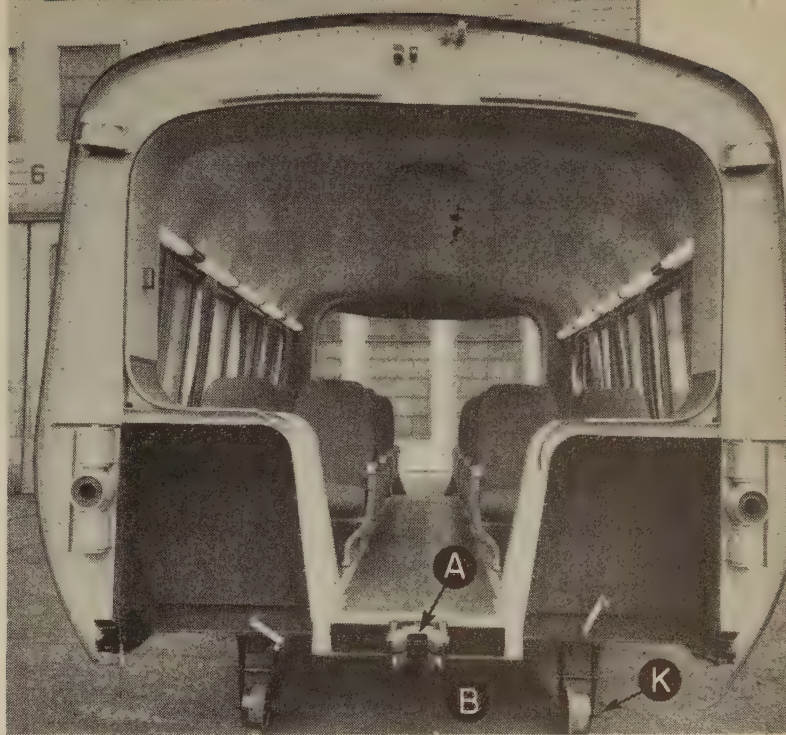


AMONG the features of the low-slung light-weight Talgo train recently built by American Car & Foundry Co. is the extensive use of alloy steel castings in the construction of the units. These castings, produced by Lebanon Steel Foundry, Lebanon, Pa., fill a number of unusual service requirements and weigh from 1 to 50 lb.

Among the alloy castings used in the 20-ft aluminum sections which make up this train are the coupler inner jaw (shown at A in the accompanying illustrations), coupler outer jaw (B), main shock strut bracket (C), the T-shaped vertical support (D), main shock strut fork (E), radius rod link (F), radius rod outer and inner disks (G), axle fitting (H), coupler clevis (J), and dolly wheels (K) which support the front end of a detached unit for switching. Among the other castings not shown here is the main engine exhaust



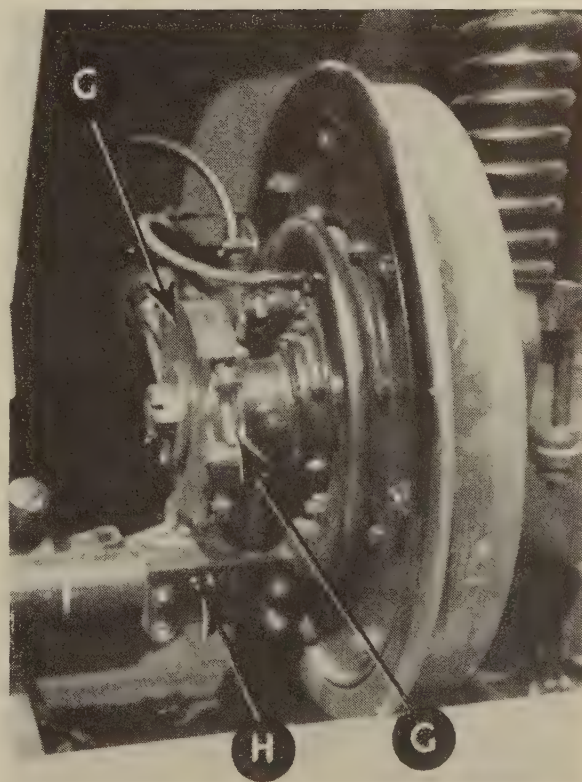
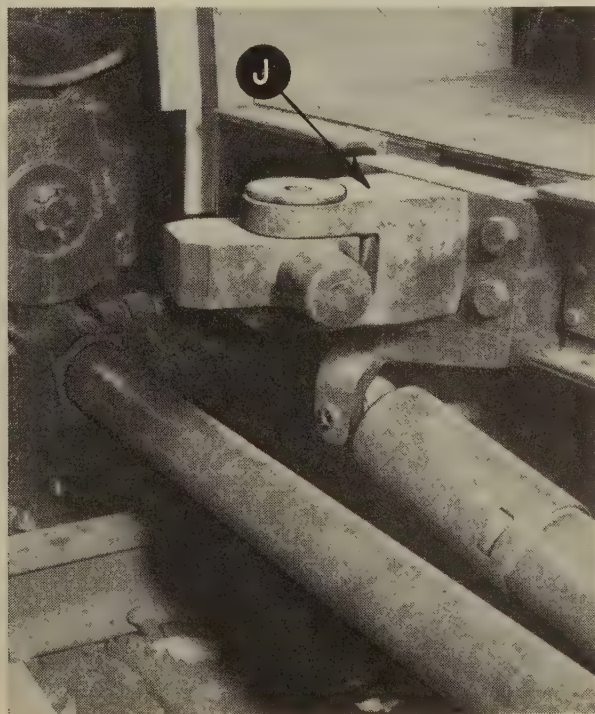
Use of Alloy Steel Castings



section which is a 25-20 Cr-Ni alloy and is used at operating temperatures up to 1800°F.

Chief alloy used in these castings was the Lebanon Circle-L 205 (grade A1) which runs 0.30 C, 0.40 Si, 0.80 Mn, 0.60 Ni, 0.60Cr, and 0.20 Mo. After normalizing and tempering, this alloy gives a minimum tensile of 95,000 psi, yield strength of 65,000 psi and an average Bhn of 210. Circle L-205 (grade C) which gives up to 120,000 psi tensile, 100,000 psi yield and 260 Bhn was also used. Circle L, grade B, with 0.25 Cr, 0.40 Si and 0.65 Mn was another alloy employed.

ACF has built and is testing one Talgo train, while two additional trains for Spain are under construction. The skins of the passenger unit are aluminum, while the locomotive skin is Plymetl.



Industrial Uses Of Radioisotopes

. . . A Bibliography

A SELECTED bibliography of published material on industrial applications of radioactive materials, to assist industry in obtaining further information on the potentialities of the new technique, has been prepared by Arthur D. Little, Inc., Cambridge, Mass.

In general, radioisotopes have two functions in industrial research: (1) For atomic tracing or detecting and (2) as compact, portable sources of radiation.

The thought has been expressed in many

quarters that industry has too little knowledge of the applicability of isotopes. The Fourth Semi-Annual Report of the Atomic Energy Commission suggests that industry has been relatively slow to benefit, pointing out that only 3 pct of the shipments of isotopes from Oak Ridge have gone to industrial users.

The following extracts from the Arthur D. Little bibliography are intended to aid in the dissemination of such information as is readily available.

General Background References

"Radioelements as Indicators," F. A. Paneth. McGraw-Hill, 1928.

"Applied Radiochemistry," O. Hahn. Cornell Univ. Press, 1939.

"Artificial Radioactivity," G. T. Seaborg, Chem. Rev. 27, 199-285, 1940.

Journal of Applied Physics, April 1941. Entire issue devoted to applied nuclear physics.

"Applied Nuclear Physics," E. C. Pollard and W. L. Davidson, Jr. John Wiley & Son, Inc., 1942.

"Radioactivity and Nuclear Physics," J. M. Cork. Van Nostrand, 1947.

Survey Articles

"Use of Isotopes as Tracers," A. H. W. Aten, Jr. and F. A. Heyn, Phillips Tech. Rev. 8, 296, 1946.

"Isotopes in Chemistry and Metallurgy," H. S. Taylor, Metal Progress 49, 1207, 1946.

"Industrial Uses of Atomic Energy," L. I. Katzin, Scientific American, Feb. 1946.

"Industrial Application of Atomic Energy; Radioactivity in Biology and Medicine," H. E. Stanton, Western Soc. E. J., 51, 176 (Dec. 1946).

"Isotopes for Industry," P. C. Aebersold. Federal Science Progress No. 1, 3 (May 1947).

"Radioisotopes; New Tools for Science," C. A. Thomas, Chem. & Eng. News, 25, 1572 (June 2, 1947).

"The Isotope Distribution Program," Science 106, 175 (Aug. 1947).

"Radioactive Isotopes As Tracers," A. W. Kramer, Power Plant Eng. 51, 102 (Oct. 1947).

"Industrial Radioactivity Uses Suggested," Chem. Eng. News 25, 2980 (Oct. 13, 1947).

"Summarized Proceedings of Conference on Applications of Radioactive Tracer Elements in Physics, Research and Industry; Manchester, July 10 to 12, 1947," J. Sci. Instruments 25, 49-56 (Feb. 1948).

"Chemical Process Control with Radioactivity," A. P. Schreiber, Nucleonics 2, No. 1, 33 (Jan. 1948).

"Putting Atoms to Work in Your Plant" and "How to Buy and Use Isotopes," A. R. Gardner, Modern Industry 15, No. 2, 50 (Feb. 1948) and 15, No. 3, 40 (Mar. 1948).

"Industrial Applications of Radioactivity," M. Blau and R. J. Carlin, Electronics 21, 78 (Apr. 1948).

"Uses of Tagged Atoms Expanding," Chem. Eng. Prog. 44, sup. 22 (June 1948).

"Red Hots Here," Chem. Ind. 62, 906 (June 1948).

"Isotopes and their Application in the Field of Industrial Materials," P. C. Aebersold. Address before ASTM, Detroit, June 24, 1948. To be published.

"Recent Scientific and Technical Developments in the Atomic Energy Program of the U. S.," Fourth Semiannual Report of the AEC, July 1948.

"Wider Use of Radioisotopes," Chem. Age 59, 152 (July 31, 1948).

"Some Problems in the Industrial Applications of Atomic Energy," G. E. Review 51, No. 8, 11 (Aug. 1948).

"Fission Products and their Uses," L. Yaffe, Nucleonics 3, No. 3, 68 (Sept. 1948).

"Isotopes for Industry," C. Carmichael, Steel 123, No. 14, 74 (Oct. 4, 1948).

"Industrial Applications of Atomic Energy," H. L. Hull. Address before American Soc. of Newspaper Editors, Minneapolis, Jan. 21, 1949.

"Industrial Applications of Radionuclides," J. W. Irvine, Jr., Anal. Chem. 21, No. 3 (Mar. 1949).

Mining and Metallurgy References

"Treating Various Metals With Radioactive Materials," S. R. McBride, U. S. 2,043,387, June 9, 1936.

"Radioactive Substances," O. Yadoff, Brit. 470,554, Aug. 17, 1937.

"Method of Preparing An Alloy Having Artificial Radioactivity," O. Yadoff, U. S. 2,175,236, Oct. 10, 1939.

"Possible Uses of Radioactive Substances in the Testing of Metals," H. F. Kaiser, Trans. Amer. Soc. Metals 27, 403-32, 1939.

"Alloy With Artificial Radioactivity," O. Yadoff, U. S. 2,225,938, Dec. 24, 1940.

"Method of Producing Metals Having Radioactivity," J. H. Dillon, U. S. 2,254,170, Aug. 26, 1941.

"Radioactive Alloy," J. H. Dillon, U. S. 2,254,171, Aug. 26, 1941.

"Radioactive Alloys," Firestone Tire & Rubber Co., Brit. 541,302, Nov. 21, 1941.

"Radioactive Alloy," J. H. Dillon, U. S. 2,268,503 and U. S. 2,268,504, Dec. 30, 1941.

"Corrosion of Copper and Alpha-Brass, Chemical and Electrochemical Studies," J. H. Holloman and J. Wulff, Amer. Inst. Min. Met. Eng. Tech., pub. No. 1458, 1942.

"Radiosulfur Tracer Study of Sulfurized Lubrication Addition Agents," G. L. Clark, S. G. Gallo and B. H. Lincoln, J. Applied Phys. 14, 428, 1943.

"Lead Isotopes as Tracers," A. C. Lane, Min. & Met. 25, 22 (Jan. 1944).

"Self Diffusion in Minerals, Particularly Copper Sulfide," A. M. Gaudin and K. C. Vincent, Amer. Inst. Min. Met. Eng. Tech., pub. No. 1663, Mining Technology, Jan. 1944.

"Measurements of the Adhesion Components in Friction by Means of Radioactive Indicators," B. W. Sakmann, J. T. Burwell, Jr., and J. W. Irvine, Jr., J. Applied Phys. 15, 459, 1944.

"Radiographic Inspection Method," R. G. Rhoades, U. S. 2,412,174, Dec. 3, 1946.

"Radioactive Tracers in the Study of Friction and Lubrication," D. J. N. Gregory, Nature 157, 443, 1946.

"An Equilibrium Study of the Distribution of Phosphorus Between Liquid Iron and Basic Slag," T. B. Winkler and J. Chipman, Amer. Inst. Min. Met. Eng. Tech., pub. No. 1987, 1946.

"Memorandum on the Use of Radioisotopes as Tracers in High Temperature Alloys," W. E. Jones, Bulletin of General Electric Co., Mar. 17, 1947.

"Tagged Atoms Invade Metals," Westinghouse Engineer, p. 150, July 1947.

"Metalworking Industry Gets Real Benefit of Atomic Pile: Oak Ridge Lab Sells Isotopes for Iron, Steel Testing," G. Hardy, THE IRON AGE, 160, 108-110 (July 10, 1947).

"Use of Radon for Industrial Radiography," A. Morrison, Non-Destructive Testing, p. 24, Fall 1947.

"A Study of Metal Transfer Between Sliding Surfaces," B. W. Sakmann, N. Grossman, and J. W. Irvine, Jr., Nat. Advisory Comm. Aer. Tech. Note, No. 1355, Sept. 1947.

"Tracer Isotopes in Metallurgy," J. K. Stanley, Nucleonics 1 No. 2, 70 (Oct. 1947).

"Radioactive Tracers in Friction Studies," J. T. Burwell, Jr., Nucleonics 1 No. 4, 38 (Dec. 1947).

"A Carburizing Experiment With Radioactive Carbon," J. K. Stanley, Metal Progress 52, 227-9, 1947.

"Gamma Ray Detection of Internal Corrosion," L. R. Keller, Petroelum Eng. 18, 211, 1947.

"Geiger-Mueller Counters Applied to Mining," A. W. Knoerr, Engineering & Mining Journal 148, No. 7, 92, 1947.

"The Metallurgist and Atomic Energy," R. F. Backer, Metal Progress 52, 800, 1947.

"Metallurgy and Atomic Energy," H. C. Plant, Metallurgia 37, 15, 137, 178, 248, 1947-1948.

"Radioactive Tracers in Metallurgical Research," E. S. Kopecki, THE IRON AGE 160, 60 (Sept. 4, 1947).

"Tracer Study of Sulfur in the Coke Oven," S. E. Eaton, R. W. Hyde and B. S. Old, Metals Tech. 15, TP 2453, 1-20 (Oct. 1948).

"Tracer Isotopes in Metallurgy," Engineer 186, 110 (July 30, 1948).

"Radioactive Tracers in Flotation; Use of Carbon 14 Especially Adaptable," A. M. Gaudin et al, Min. & Met. 29, 432 (Aug. 1948).

"Radioactive Isotopes of Cobalt and Selenium May Have Important Possibilities in Industry," D. M. McCutcheon, Steel 123, 61 (Nov. 29, 1948).

"New Method of Measuring Diffusion Coefficient in Solids With Radioactive Tracers," G. C. Kyzczynski, J. Applied Phys. 19, 308, 1948.

"Radioactive Tracers: How They Can be Used in Flotation Research," Engineering & Mining Journal 149, 53, 1948.

"Radioactive Isotopes as Sources in Industrial Radiography," G. H. Tenney, MDDC 1690.

Miscellaneous

"Use of Radioactive Tracer Elements to Identify Minor Constituents in High Temperature Materials," W. E. Jones, Bulletin of General Electric Co., Sept. 10, 1948.

"Studies of Lead Oxides. The Radioactive Indicator Method Applied to the Lead Storage Cell," G. Clark and R. Rowan, J. Amer. Chem. Soc. 63, 1299-1302, 1941.

Water Cooled Cupolas

USE of water tanks in place of refractories in the cupola melting zone was discussed at a recent meeting of the British Iron & Steel Research Institute in a paper entitled "Water Cooling of Cupola and Tuyeres." The paper, presented by W. H. Bamford, Austin Motor Co., Ltd., was reported in the May issue of Foundry Trade Journal (London). The author described the initial and final stages in the development of cupolas using water tanks in place of refractories for the melting zones. These tanks, $4\frac{1}{2}$ in. deep, 22 in. wide and 30 in. high, were arranged 1 in. apart around the inside circumference of the cupola above the tuyeres. They were made of cast steel $\frac{1}{2}$ in. thick with the back welded on; the front was corrugated and suitable water inlet and outlet connections were attached. In use, the

tanks were backed by ganister and the corrugations in contact with the melt were filled with ganister. The cooling water reached 160°F normally, and sometimes boiled, but there was no observable decrease in metal temperature or increase in coke consumption. Tanks have outlasted 2 years' service. Brook water was pumped through the eight tanks per cupola at a rate of 64 gal per min. A safety outlet was provided for each tank; if a leak developed, it was caulked until the weekend, when the tank was replaced.

Slag holes were similarly comprised of a cooling tank, but were arranged with a key-shaped hole, the tang of the key being filled with ganister and used as a reserve slag outlet. A thicker-section steel tank was used at the charging hole to take the impact of the falling charge.

New Grid

By EUGENE WILLIHNGANZ

*Director of Research,
Gould Storage Battery Corp.,
Depew, N. Y.*

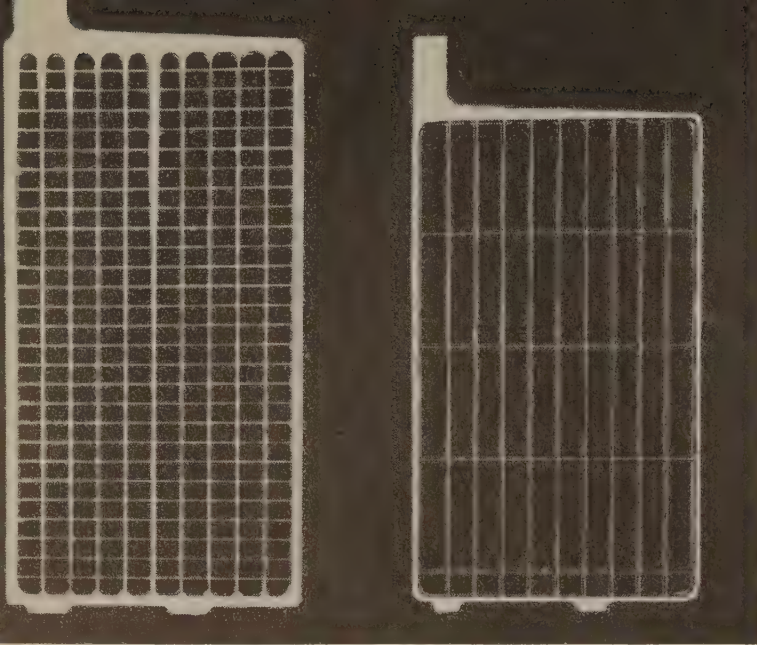


FIG. 1—A comparison of a new type grid (right) and a previous design (left). These grids are for batteries of comparable capacity.

RESEARCH in both mechanical design and techniques of soft-metal casting have recently produced a new type of lead grid for supporting the active oxides in the positive plates of lead-acid storage batteries. The new type of grid, shown in fig. 1, promises to bring to industrial storage battery users markedly longer battery life.

This discussion is intended to explain the steps which led to this development and to explain how this new design will improve the life of industrial

storage batteries used in such applications as industrial lift trucks, mine haulage equipment, diesel engine starting motors, railroad car lighting and airconditioning circuits, etc.

The failure of metallic lead members in positive grids is responsible for 90 pct of all motive power battery troubles today. It is grid design and grid casting which are currently the determinants of battery service. This was not always so. Battery improvement over the years has been a story of constantly increasing the life of the weakest element in battery construction so that it outlasted the next weakest element, which in turn became the object of development.

At the research laboratories of the Gould Storage Battery Corp., the attack has been two-pronged: (1) Lead casting techniques and (2) grid shape. Both interlock. Casting technique affects design and vice versa.

Basically, the two problems reduce to one—eliminating shrinkage porosity, for it has been found that grid failure in lead-acid batteries almost invariably occurs where voids and porosity have permitted the acid to attack grid members (in battery chemistry, to peroxidize) from the inside.

There are two varieties of shrinkage porosity in the gravity casting of antimonial leads of the types used for battery grids.

First, simple cavities, or pipes, are formed by the solidification-shrinkage of liquid masses which are completely encased in solid envelopes of previously frozen metal.

Second, a general mushiness in castings can be developed when a pure lead matrix first freezes

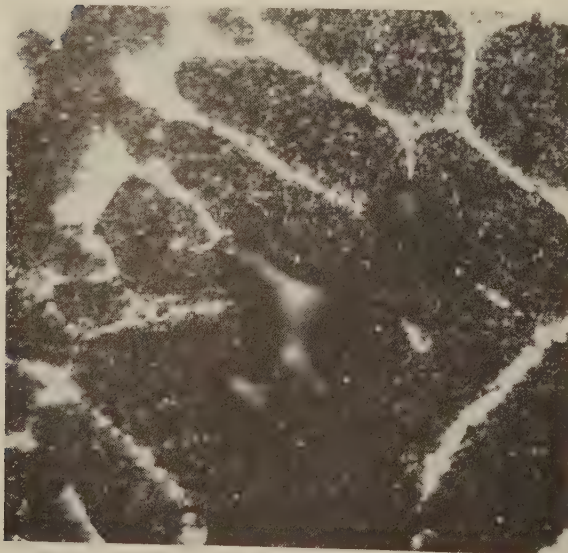


FIG. 2—Micro (1000X) of a pore in a battery grid. Dark areas are practically pure lead; bright areas are the antimony eutectic with a lower melting point.

Casting Improves Battery Life

Development of a new grid design and improved casting techniques, as described in this article, are expected to result in substantial increases in service life of industrial storage batteries through the elimination of shrinkage porosity.

out (at 630°F) and the remaining antimonial phase stays liquid while it concentrates to the 12 pct eutectic, then freezing out at a lower melting point (477°F). In such a case, a widely distributed and very fine intergranular porosity develops. This may extend to the surface of the casting where acid can easily get at the pore system. Fig. 2 is a photomicrograph of such intergranular separation of the eutectic from the pure lead phase, a case in which the pure lead phase was permitted to freeze too quickly.

The cure is obviously a matter of controlled and progressive solidification. Both grid design and casting technique influence such solidification.

Four factors of casting technique are important. First, the gating into the mold by the new technique is through much smaller openings than usual. Thus the rate of flow of metal is slowed. Second, the casting temperature is higher so that freezing cannot occur in the wrong grid members at the wrong times. Third, the pouring of the new grids is wholly from the top lug so that no shearing of the sides or ends of the grid frame is necessary. Such shearing has previously provided entrance to corrosive battery acids by disclosing edge porosity. Side and bottom shearing frequently also produces sharp edges which contribute to the cutting-through of battery insulation and separators. The as-cast edges of the latest type grid shown at the right in fig. 1 are rounded for improvement in this connection.

Fourth, and most important, the grid shown at the right in fig. 1 is produced in a mold with close control of heat transfer rates at various

points, so that the freezing of the metal begins at a predetermined point and proceeds slowly and evenly throughout the entire grid mass. A view

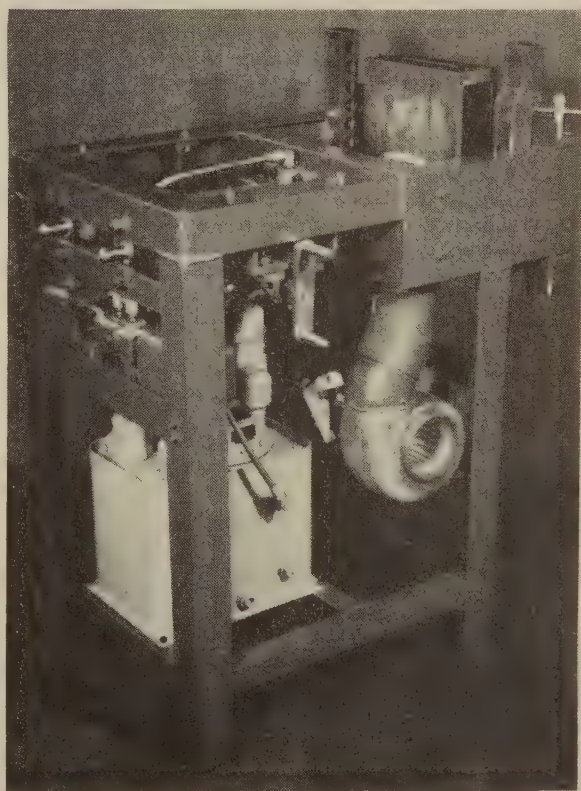


FIG. 3—Partly assembled casting machine. This unit is hydraulically operated and air-cooled.

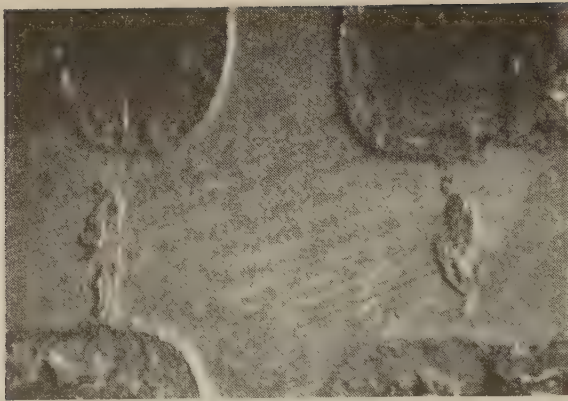


FIG. 4—Cross-section of an intersection of two grid members showing how corrosion has almost completely ruptured the vertical member. The two roughened areas on each side of the intersection consist of lead peroxide in the interior of the grid.

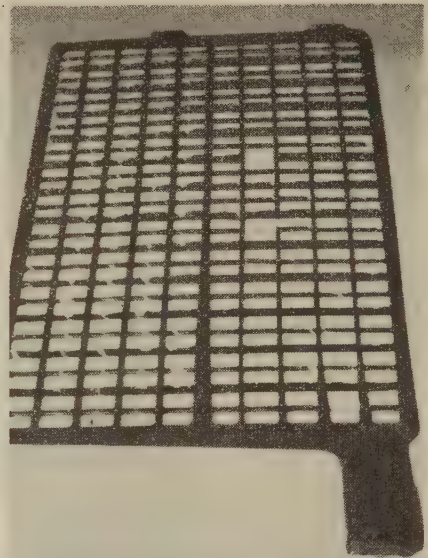
of the new type casting machine is shown in fig. 3.

Many techniques contribute to careful control of this important progressive solidification of lead in the mold. For one thing, the mold is finned externally and cooled by air blast at specific locations so that the gradations of mold temperature are exactly as needed. Another factor is the use of mold coating compounds with proper heat insulating characteristics. And finally, ample overflow zones are provided above the small gate opening so that the simple shrinkage cavities (or pipes) which are bound to occur at the very tag end of the freezing process occur in the useless remelt stub above the gate.

Also for reasons of eliminating porosity, the shape and design of grids is important.

The grid shown at the left in fig. 1, for example, is representative of conventional design. The grid shown at the right is the new Gould Z grid, designed to use every known device for eliminating porosity. To battery designers this grid is rather unusual in appearance. First, the areas of the unsupported cells of active material seem enormous. Second, the elongated vertical shape of each cell of granular material held by such a grid is most unusual. And third, the extreme simplicity of the design is in direct contrast to the intricacy of many of the interlaced lead networks of which the industry has seen so many.

Note at the left in fig. 1 how many are the differences in cross-sectional area between members at various locations in the same grid. In the new grid both the vertical and horizontal members



A

are of exactly identical cross-section. Note also that the ratio of mold surface to amount of grid metal is much lower.

It has been found that porosity, due to differential rates of freezing, occurs where relatively fine members intersect relatively heavy members, as shown in fig. 4. And it has also been learned that the greater the ratio of mold surface to enclosed metal, the greater the opportunity for liquid masses to be entrapped by frozen envelopes.

It is also significant that the cross-sections of each of the vertical and horizontal members of the new grids are diamond shaped. Thus a minimum of lead surface is exposed to direct contact with the acid electrolyte in the battery assembly, as illustrated in fig. 5, yet the structural characteristics of the members are sound. The V-notching by means of which the new type grid members grip all sides of each enclosed pellet of active oxide is adequate for secure holding of the active material in place over extremely long periods of battery life.

A comparison of the effectiveness of the new design as compared with earlier designs is given in fig. 6. This illustration shows three conventional grids which have been corroded by a three-

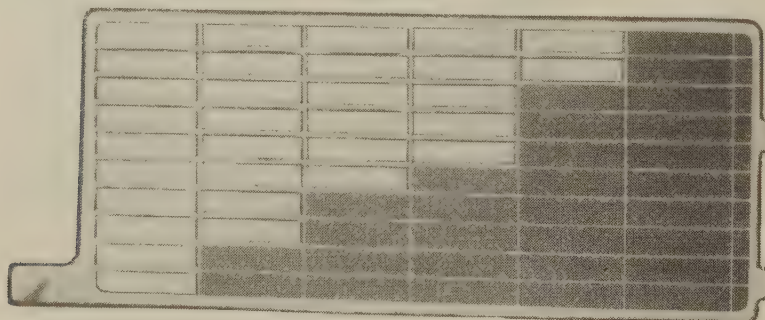
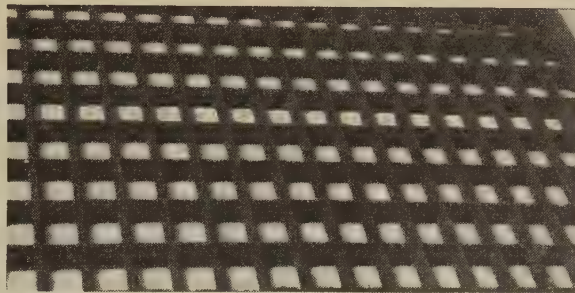


FIG. 5—Illustrating the manner in which the new grid design minimizes amount of lead surface exposed to direct contact with the acid electrolyte.



B



C

FIG. 6—At A is shown a commercial type grid after an accelerated laboratory corrosion test; a pitting type of corrosion has seriously weakened the grid. B is a laboratory cast grid illustrating damage occurring when grid members are not completely sound. At C is an experimental grid in which improved casting conditions were first developed. Note that no pitting corrosion is in evidence after a prolonged corrosion test.

month accelerated test and also a new type grid which was exposed to even greater life-testing abuse.

Other tests, performed by exposing fractured sections to acid attack and then counting the centers of characteristic brown stain under the microscope, prove beyond question that the new techniques, properly employed, can reduce porosity from 85 to 90 pct.

The electrical capacity of grids manufactured in line with the principles just described is such that grids of the new type can be made shorter than grids of the old type—ampere-hour for

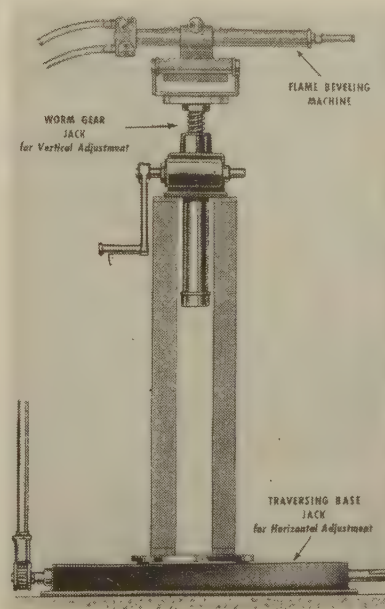
ampere-hour. The result is that there can be greater space over grid tops and electrolyte level in existing standardized battery jar designs. This makes it easier to withdraw electrolyte into hydrometers for necessary battery maintenance, and allows greater latitude in electrolyte level.

Already it is abundantly clear that a major, basic step forward has been made in battery grid improvement—although the net result in service life in the batteries of the immediate future is a matter on which no manufacturer will commit himself to specific promises at this early stage of development.

Flame Beveler Positioning

THE problem of flame beveling tank plate preparatory to welding was solved in one instance by the use of worm gear jacks and traversing bases. Normally, preparatory to welding, tank plate edges are beveled with a flame beveling machine. The machine is mounted on a stationary frame and the tank is raised or lowered to accommodate the height of the frame. This procedure is not only laborious and costly, but must be executed with extreme care for consistently good results.

A more efficient method, developed by engineers of Duff-Norton Mfg. Co., Pittsburgh, permits positioning of the beveling machine frame rather than the tank. The flame beveling machine was mounted on a positionable frame controlled by three vertical worm gear jacks and three horizontal traversing base jacks. This permitted raising and lowering the bevel machine to any desired level, and permitted horizontal locating. This arrangement is shown in the accompanying illustration.



... Brazing in Salt Bath

SALT bath brazing has much in common with dip brazing, but does not suffer the disadvantage that the whole of the area dipped into the bath is covered with the brazing alloy. Recent developments in this method of brazing, as well as some of the advantages and results of investigations, are discussed in the March, 1949, issue of the British publication, *Metallurgia*. In salt bath brazing, as compared with dip brazing, the amount of brazing alloy required is reduced and the necessity for cleaning off excess alloy is obviated. There are certain types of work that, because of construction, are unsuitable for dip brazing but can be brazed in salt baths.

In salt bath brazing, a relatively small amount of alloy in the form of wire, strip or granules, is placed within or near the zone to be joined. The work is heated by a short immersion in a molten salt bath and subsequently cooled and washed. There is no scaling of the parts.

Compared with torch and ordinary furnace brazing, salt bath brazing has several advantages. Its speed of operation and reduced labor costs are favorable. Temperature control can be accurate. Less work in finishing is required because of the scale-free finish. Several joints of a complicated assembly can be brazed simultaneously.

In a copper tube and mild steel plate assembly,

using silver solder, the total immersion time was $1\frac{3}{4}$ min at 1436° to 1472°F. The brazing operation was performed in a bath of molten sodium cyanide, followed by air cooling and washing.

Table I shows various brazing materials. Three sizes of wire, 14, 18 and 20 SWG (0.180, 0.168, and 0.161 in. diam) are used in salt bath brazing, the intermediate gage being the most common. Sheet and strip brazing materials are normally 0.002 to 0.010 in. thick. In certain instances, granular brass is used.

Copper or silver brazing is used to join pure nickel, Inconel, Monel and stainless steel, while brass is extensively used for steel. Silver alloys are suitable for joining brass or other copper alloys and for brazing steel parts that must essentially be joined at low temperatures. No flux is required for brazing with copper, silver or brass, but a flux containing a proportion of fluoride should be used with silver solders.

In joint design, attention must be paid to clearances between parts to be joined. Clearances should be preferably less than 0.005 in. on diameter, although satisfactory joints have been made with greater and variable tolerances. For strongest joints, the clearance should be 0.002 to 0.003 in. on the diameter.

Experiments made with a design somewhat

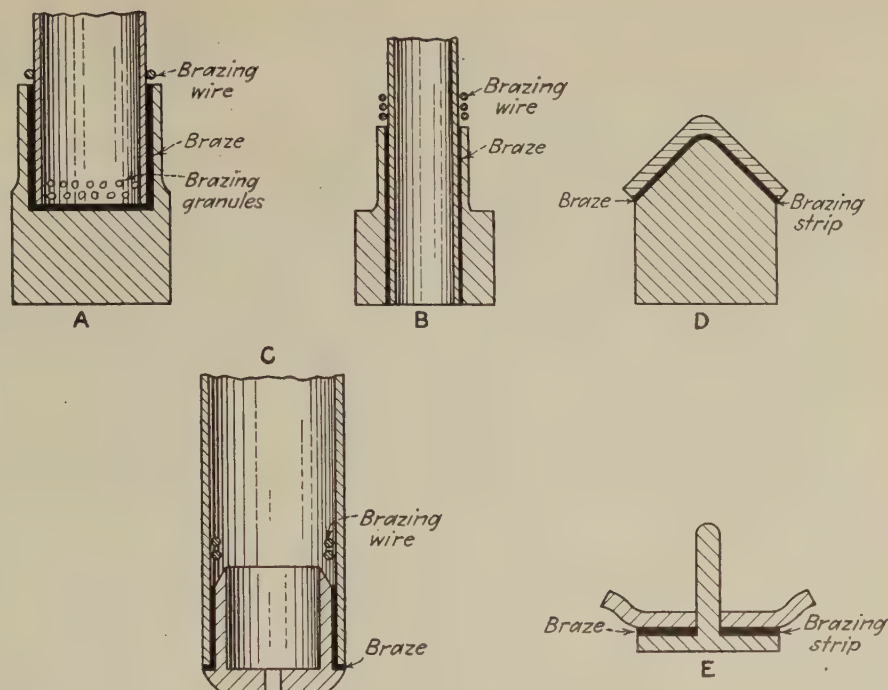
TABLE I
Brazing Materials and the Temperatures Employed

Brazing Material	Elements in Brazing Material, Pct					Melting Point, °F	Brazing Temperature, °F
	Copper	Silver	Zinc	Lead	Cadmium		
Copper	Pure					1981	
Silver		Pure				1760	2048 1832-1868
Brass (BS 263: 1931)							
Grade AA*	59-61		Remainder	0.50 max	Total	1634-1652	1688-1742
Grade A**	53-55		Remainder	0.50 max	Impurities	1616-1634	1670-1724
Grade B**	49-51		Remainder	0.50 max	0.75 max	1598-1616	1652-1706
Silver Solders (BS 206: 1941)							
Grade A	27.5-29.5	60-62	9-11			1274-1355	1418-1472
Grade B	36-38	42-44	18.5-20.5			1292-1427	1508-1544
Grade C	14-16	49-51	15-17		18-20	1103-1166	1256-1310
ASTM Specifications							
Grade 1	52	10	38		0.50 max	1508	1598
Grade 3	45	20	35			1427	1499
Grade 4	30	45	25			1283	1427
Grade 6	20	65	15			1283	1328

* Grade AA is supplied as slittings or wire.

** Grades A and B are in granular form.

Furnaces



● Fig. 1—Typical joint designs for brazing in salt bath furnaces.

similar to joint A in fig. 1 except that a 1/2-in. diam steel bar was fitted into a similar size bore with varying clearances. The length of joint was 1/2 in. and brazing was done in a cyanide bath at 1742°F using a brass wire applied externally. In table II are shown the loads required to rupture for the various test pieces.

Five typical joint designs are shown in fig. 1, with details of the method of applying the brazing alloy in each case. Joint A is best brazed by placing granular spelter internally and a ring of brazing metal externally, and joint B by applying wire externally. The wire is always placed above the joint so as to flow downwards when it melts.

Alternatively, joints A and B can be brazed by making an internal recess in the collar, or by rolling a groove in the tube and placing therein the wire or strip. Joint C is best brazed by using internally placed wire as shown, and sheet or strip brazing alloy is used for joints D and E.

Cyanide baths containing 25 to 50 pct sodium cyanide are ideal for many purposes when brazing in the range of 1202° to 1742°F. They are used for brazing steel to steel with brass or silver solder and for joining brass to brass or copper with silver solder. Other British patented salt preparations are listed for brazing other metals in other temperature ranges. Nickel and high nickel alloys are susceptible to embrittlement by sulfur, and before using high temperature salts for brazing such material, any small amounts of sulfur should be removed by suspending nickel turnings or scrap sheets of nickel alloy in the bath for 2 hr at brazing temperature.

Procedures for salt bath brazing as outlined

by *Metallurgia* begin with cleaning of scale or grease, placing the brazing alloy in position and applying a fluoride flux if the brazing alloy is a silver solder. The assembly is then warmed to remove moisture before immersion in the salt bath, which is held, according to the alloy used, at the brazing temperatures shown in table I. Joints D and E can be immersed in the salt bath immediately. With joints A, B, and C, employing external or internal brazing wire, it is necessary to heat the joint to brazing temperature before the wire melts. Otherwise the brazing alloy will flow outside the part but not into the joint. This is easily done by first partially immersing the joint in the salt bath for a minute or two, leaving the wire just above the level of the bath. When the joint reaches temperature, the assembly is lowered to melt and flow the brazing alloy. The whole operation is quickly carried out, the time varying from 30

TABLE II

Strengths of Joints with Varying Clearances

Note: In a joint similar to Fig. 1A except that the 1/2-in. bar was fitted into a 1/2-in. bore with varying clearances, brazing was accomplished with externally applied brass in a cyanide bath at 1742°F. The length of the braze was 1/2 in.

Clearance on Diameter, In.	0.001	0.002	0.003	0.004	0.005	0.006	0.008	0.010
Load to Rupture in Tension, Lb.	21,500	24,700	21,300	20,160	20,820	19,400*	14,800*	16,700*

* Test pieces broke at collar, joint remained intact.

sec to 4 min, depending upon the mass of the piece.

It is frequently necessary to hold the parts in fixtures for immersion in the salt bath and as a little excess solder may braze the part to the fixture, care is necessary in the method of fixturing. In cyanide containing baths, satisfactory fixturing can be effected by using stainless steel fixtures, which do not braze in cyanide baths. Certain designs of joint are best tack-welded before brazing.

Quenching in a neutral salt bath followed by an air cool gives a better finish than cooling directly from the brazing temperature in air. Air cooling can be used provided the finish is acceptable. Occasionally oil quenching causes the joint to blow a little. Water quenching from the brazing bath is too drastic and tends to cause

the joining material to blow out or spatter, although it may be satisfactory in specific cases. Whichever method is used, the brazed part should be allowed to cool well below the brazing temperature before quenching. Each job has to be considered on its merits and the handling procedure developed accordingly.

Care should be taken that the salt is not left trapped in blind joints. By having a particularly good fit or by immersing the joint in the salt bath to the minimum possible depth, salt can sometimes be prevented from flowing in appreciable quantities into blind joints. Alternatively, such joints should be provided with a drainage hole to allow salt to run away after brazing. With the exception of those that have no blind holes and which have been water quenched, parts must always be washed in hot water to remove salt.

Weaving Stainless Steel Screening

VIEWS of some of the operations involved in the production of stainless steel screen cloth at the Hungerford mill of Superior Wire Cloth Co., an associate plant of Chase Brass & Copper Co., are shown in the accompanying illustrations. The screening is woven from type 316 wire, 0.009 in. diam, to a cloth of 18x18 mesh. Fig. 1 shows screening being inspected as 36-in. cloth is rewound into 100-ft rolls for shipping.

Wire is received at the mill on small wooden spools which are mounted in the warping creel and the wire from each spool is fastened to the warp drum and wound onto this drum. When the warp drum is fully wound, it is positioned on the warp end of the loom, as shown in fig. 2.

The threading of the loom requires that each stainless wire on the drum be fastened to the proper heddle. In a piece of screen 48-in. wide, 764 wires must be threaded. Finished stainless screen cloth as it comes off the loom, shown in fig. 3, is wound onto a take-off spool which holds 1000 ft of cloth. The stainless screening is now available in even widths from 24 to 36 in., and in 42 and 48-in. widths.



FIG. 1

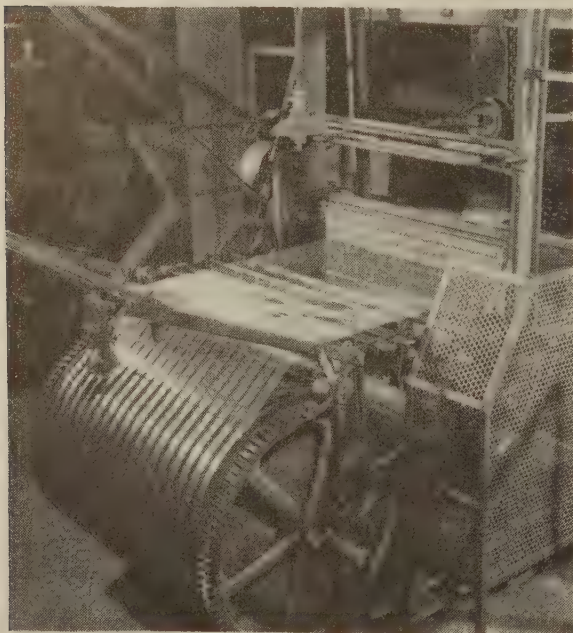


FIG. 2

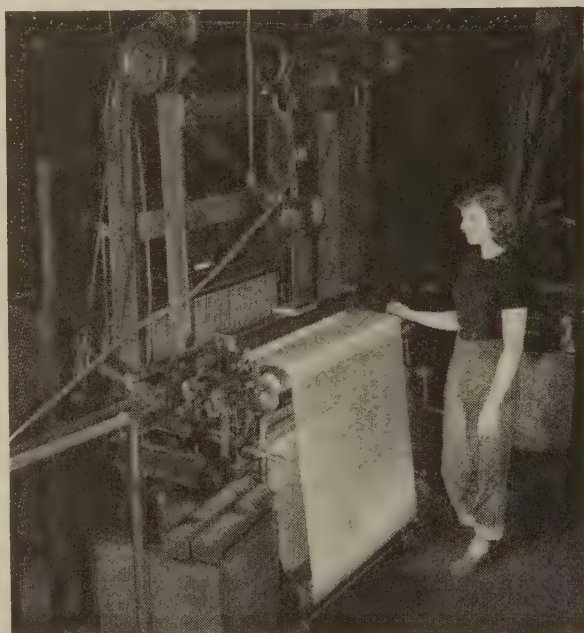
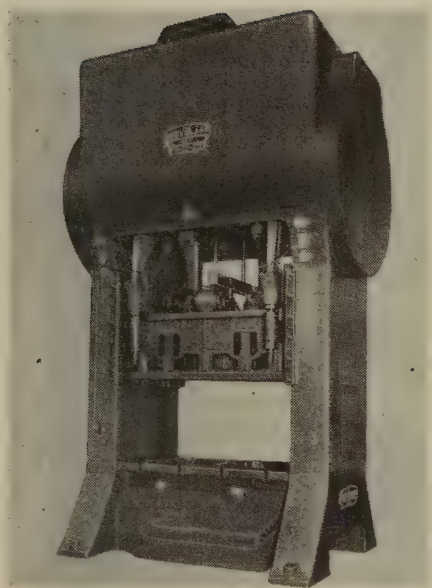


FIG. 3

New Production Ideas . . .

A two point toggle press, multiple turning lathes, a broach sharpener, a hydraulic pay-off reel, air-driven belt sanders, automatic coil feeds, an electronic counter for piling tinplate, a metal disintegrator, and an induction heater are described this week, together with collet chucks, milling cutters, a reversible screw driver, and a casting sealant.



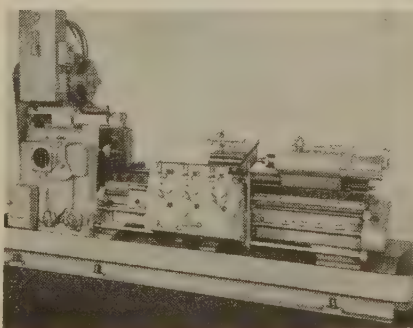
Two Point Toggle Press

A NEW two point toggle press is double geared, has twin drive, and is equipped with an electrically controlled air operated friction clutch. The press is arranged with air counterbalance to both the inner slide and the blankholder slide, with power adjustment to the inner slide by means of an individual motor. All four corners of the blankholder slide may be individually adjusted manually. Gears and driving unit are enclosed in the box type crown and there are no overhanging brackets or other projections. The driving links of the toggle mechanism, together with the bearings, are lubricated by a constant flow of oil under pressure. The long dwell of the blankholder enables the dwell to move back with respect to the slide motion. Because of this the blankholder drops only approx 1 in. when the inner slide is at top center. This provides more clearance between the face of the slides and the dies for the re-

moval of stock. The press operates at 8 strokes per min, has a capacity of 200 tons for the inner slide and 120 tons for the blankholder slide, and is equipped with a 35-ton pneumatic cushion at 100 lb air pressure, 10-in. travel. The inner slide is provided with 23-in. stroke and 5-in. adjustment and the bed area is 45x72 in. *Cleveland Punch & Shear Works Co. For more information, check No. 1 on the attached postcard.*

Multiple Turning Lathe

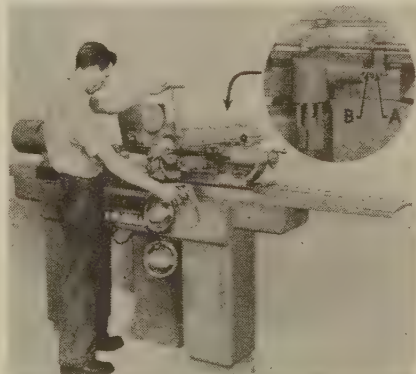
THE new Lo-swing lathe is a high-speed multiple turning lathe recommended for shaft work involving long shoulder lengths where overlapping of cuts is not desirable, and also suited to short-run jobs. A multiple slide front turning carriage on this semi-automatic lathe operates on the rack and pinion feed principle permitting longer cuts, it is said, than are possible with cam-operated closed cycle lathes. Heavy stock removal with sintered carbide tools is possible due to the balanced twin rack pinions meshing with the steel rack, cutting the unit tooth pressures in half. Carriage cross slides are power operated and individually controlled; hinged-type roller steady rests prevent work from springing away from the tools. Other features



include: Automatic feed throwout coupled with automatic tool relief; rapid traverse movements for longitudinal carriage feed and cross slides, and for the automatic back attachment; manually-operated safety feed clutch; heat treated headstock spindle mounted on heavy-duty ball bearings; and pulley shaft equipped with multiple disk clutch and brake permitting continuous rotation of the electric motor and instant stopping of the headstock spindle. *Seneca Falls Machine Co. For more information, check No. 2 on the attached postcard.*

Broach Sharpener

A STEP-STOP microfeed cuts a broach sharpening time 25 pct on a new universal sharpener, designed to sharpen internal and surface broaches up to 36 in. long x 6

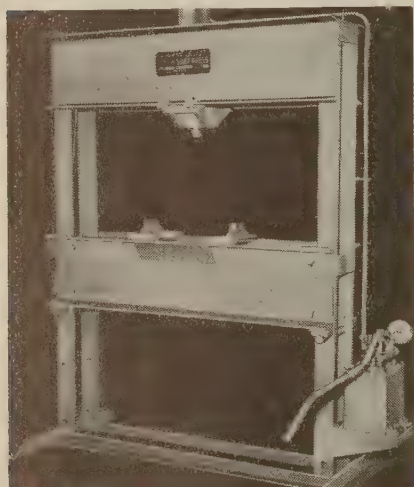


in. diam. The broach is inserted between the motorized two-speed headstock and the quick-release spring loaded center tailstock. Center point steady rests provide center point support opposite the wheel and on underside of the broach. The Step-stop micro-feed is composed of a micro-feed handwheel that controls the setting of a plunger (B) in the Step-stop control. Bracket (A) when it contacts

the plunger limits the travel of the wheel when using the easy-swing hand lever. Setting of the bracket (A) for any broach is made with the wheel at full depth on the largest diameter tooth on the broach and with the plunger all the way out. The additional feed required from tooth to tooth as the broach diameter decreases is provided by the microfeed handwheel. *Colonial Broach Co. For more information, check No. 3 on the attached postcard.*

Shop Presses

STANDARD shop presses of 60 and 80 ton capacity are designed for light-duty press requirements. They feature a full 13-in. pressure stroke, accurately matched and machined V blocks, lower bolsters supported by bearing blocks



on steel support pins, fast arbor press action eliminating need for separate arbor press, and operation by hand or power pumps. An improved two-speed hydraulic hand pump with automatic shift permits fast ram speed, $1\frac{1}{8}$ in. per stroke with 2-ton high speed pressure on the 60 model and $\frac{3}{4}$ in. travel with 3 tons pressure on the 80. When the maximum pressure has been reached the pump shifts automatically into high pressure. *Rodgers Hydraulic, Inc. For more information, check No. 4 on the attached postcard.*

Hydraulic Pay-Off Reel

COILS from 12 to 60 in. face, up to 30,000 lb in weight, can be handled on a new hydraulic pay off reel that has a hydraulically operated 6-in. expansion on all sizes. With hydraulic pressure at all times on the four jaws that are fitted with wedge baring surfaces,

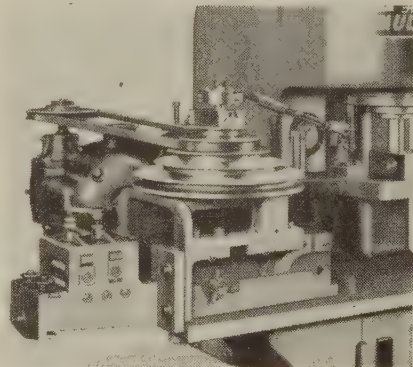
they tend to creep out and continue to creep out as the coil build up is reduced by unwinding. The coil is tightly held at all times from start to finish. Another feature is the rapidity with which a coil is tightly gripped, no wrenches, cranks or



other tools being required. A valve lever controls the opening and closing operations that require only a matter of seconds. The reel is provided with the necessary electrical and hydraulic equipment and with an adjustable brake to aid in maintaining a more or less taut pass-line. *Paxson Machine Co. For more information, check No. 5 on the attached postcard.*

Automatic Coil Feed

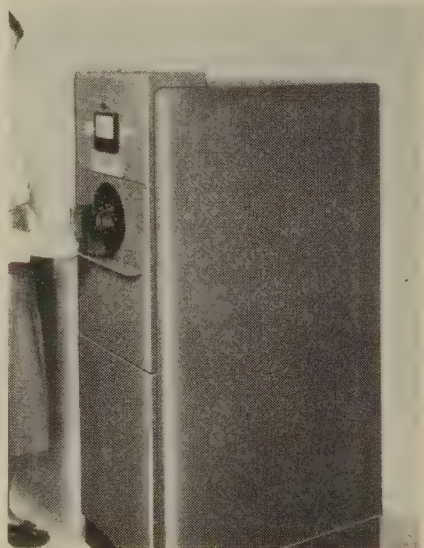
BY automatic feeding of strip stock to punching dies with the use of the new Harmonic stock feed, 50,000 pieces per hr can be produced on the oil-hydraulic Multipress. Several models each provide wide, stepless variations in speed and feed characteristics within limits of the equipment. Up to 838 cycles per min are possible with the high-speed unit, and 66 cycles per min at low speeds. Feed rate of the device may be adjusted. An accuracy of ± 0.002 in. is said to be maintained with this equipment.



Coil stock up to 3 in. wide x $\frac{3}{64}$ in. thick may be fed up to 3 in. per stroke. Feeding motion is synchronized with the motion of the press ram. The accessory is available for use with Multipresses up to 8-ton capacity. *Denison Engineering Co. For more information, check No. 6 on the attached postcard.*

Induction Heater

WITH a new ultra fast 2 kw induction heater, work can contact the heating coil with no danger of electric shock to the operator and without upsetting the fast uniform heating action of the high frequency field. The heater uses vacuum condensers and vacuum power tubes. The current flowing in the heating coil is high, 100 to 200 amp; the operating voltage, low, 10 to 20 v. The heating operation is completed in so few seconds that the heat does not travel more than $\frac{1}{2}$ in. down the rod. Design improvements that speed soldering, brazing, and hardening jobs include: Heavy tool type output terminals with interchangeable coil blocks; forced air cooling with



cooling exits through a top cowl directed away from the operator; accessibility to fuses through a removable lower panel, and to a special single point adjustment for adjusting to any single phase factory line of 200-250 v. *Sherman Industrial Electronics Co. For more information, check No. 7 on the attached postcard.*

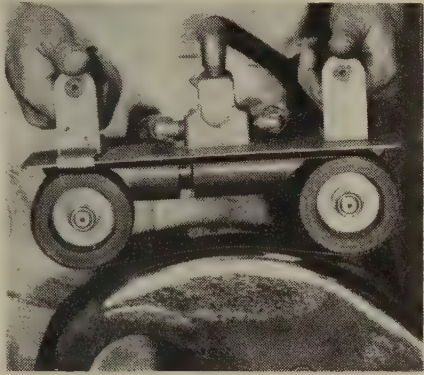
Multi-Flow Rotameter

A NEW multi-tube rotameter can be built with two or more rotameter tubes in it for use on related flows. The standard Brooks full-view rotameter end fittings are fastened to a metal back plate with dowel pins and cap screws. The front of the unit is shielded with a plastic window, $\frac{1}{4}$ in. thick. Each tube with its fittings may be removed without disturbing any of the other parts. Compactness and

close correlation of related flows are advantages of this unit. *Brooks Rotameter Co. For more information, check No. 8 on the attached postcard.*

Air-Driven Belt Sander

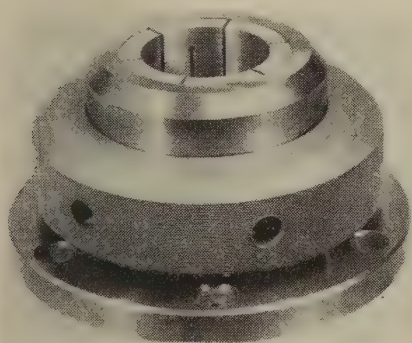
A NEW air-driven belt sander is adaptable for metal work on all types of surfaces, concave or convex. It is applicable to all



types of metal finishes, both sheet metal and solid castings, and to all types of materials in iron, steel, brass, bronze, solder, aluminum and magnesium. *Buckeye Tools Corp. For more information, check No. 9 on the attached postcard.*

Collet Chucks

EVERY part except the knurled spanner lock nut is of a non-magnetic conductor material on a precision collet chuck developed for inspecting electrical parts. Current flows through the collet chuck freely for inspection and the chuck is designed to hold concentricity during inspection. Double angle principle is said to assure concentricity

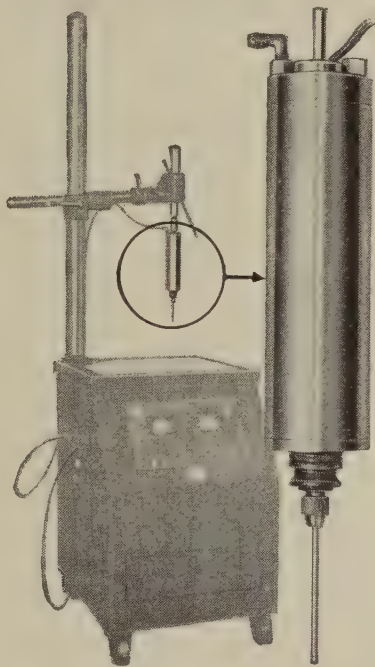


through positive contact over OD surface. *Erickson Tools Div. For more information, check No. 10 on the attached postcard.*

Metal Disintegrator

GREATER cutting speed and actual die work cutting accuracy are claimed for the 1950

Thomas Metal Master. It removes $\frac{3}{8}$ in. $\frac{5}{8}$ in.-long broken taps in 60 sec, cuts a 0.155 in. hole through $\frac{1}{4}$ in. Carboloy in 5 min, $\frac{3}{8}$ in. Stellite in 40 sec and $\frac{3}{4}$ in. high speed steel in 60 sec. A collet on the new model does away with the screw-type electrode and permits standardization on a 9-in. Thonmium electrode that may be moved out from the collet as the cutting depth increases. This process increases the rigidity of small-size electrodes, which, with the elimination of the threaded ends, produces accuracy of from 0.003 to 0.005 in. High cutting current of 50 to 200 amp as supplied to the electrodes is not present in the solenoid coil that is fed by low-



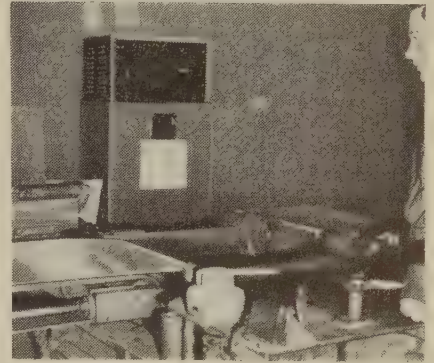
voltage low current. Speed of the Metal Master head is electronically controlled. *Clinton Machine Co. For more information, check No. 11 on the attached postcard.*

Bender Cabinet

A MOUNTING pedestal for No. 2 and No. 3 Di-Acro benders is of welded steel designed to withstand the pressure to which it is subjected in bending heavy materials. Dimensions are 15x15x34 in. and the working height with the bender mounted is 38 in. Two shelves provide storage space for the various bending mandrels. *O'Neil-Irwin Mfg. Co. For more information, check No. 12 on the attached postcard.*

Electronic Tinplate Counter

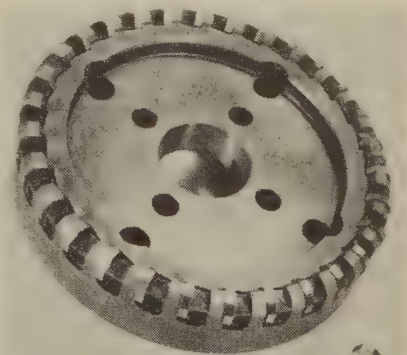
HIGH speed predetermined electronic counters can be used for piling tinplate in precise quantities. The sheets are counted photoelectrically as they pass on a split conveyer belt and when the selected predetermined count has been reached the counter automatically operates a deflector mechanism to start a new pile. Dual counters will



predetermine two different counts occurring in sequence and are used also to provide a warning signal to the operator at a predetermined number of sheets before the desired count. The electronic counter has a compact photoelectric count detector that is contained in two aluminum cast housings. One housing contains the light source and the other contains the photocell and output tube. Counting rates as high as 60,000 per min can be reached. *Potter Instrument Co. For more information, check No. 13 on the attached postcard.*

Milling Cutter

DESIGNED for feed rates up to 60 ipm, a new high production cast iron face milling cutter

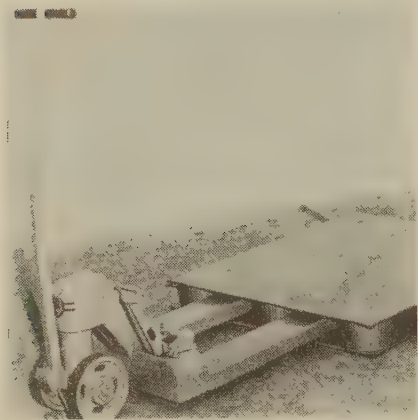


utilizes a solid carbide octagonal-shaped blade permitting 16 production runs without the regrinding or resharpenering of any cutter.

When a blade becomes dull after cutting on one of the 45° chamfers, it is indexed to the next position; and then after eight runs the blade is reversed and an equal number of runs is obtained from the other side. Cutters may be ground down to a smaller size after 16 runs for a job requiring a reduced dept of cut. Necessary rake, relief and clearing angles are ground into the cutter body. *Diamond-Detroit Inc. For more information, check No. 14 on the attached postcard.*

Lightweight Pallet Truck

EXPENDABLE four-way corrugated paper pallets having large cylindrical supporting columns can now be handled by a new hand pallet truck. The truck has a narrow overall width of 22 in., each fork being 6 in. wide with 10 in.

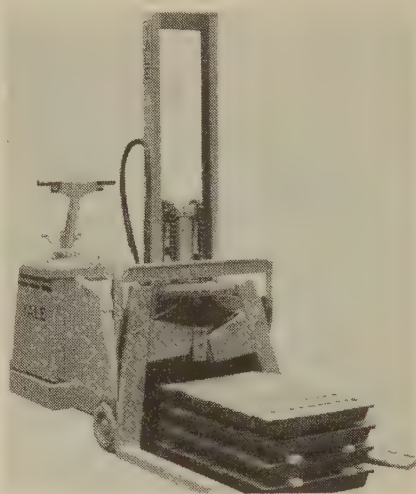


opening between. Features also include rubber tired front wheels, handle holdup, and an improved foot pump with separate pedal release. A friction brake engages the floor when the towing handle is held in the down position. The capacity of the truck is 2000 lb; lowered height is 3¼ in. and elevated height, 7¼ in. Standard booster rolls in the fork ends make it possible to operate the truck in the standard double faced wooden pallet. *Lyon-Raymond Corp. For more information, check No. 15 on the attached postcard.*

Fork Lift Truck

ODD handling jobs peculiar to particular industries are possible with a series of special-attachment Worksavers recently announced. The first is the Bunnyhugger developed to handle large crates, pigs, or bales of fabric. To pick up loads, the Bunnyhugger is

maneuvered so that the load is between the forks; manipulation of a control-lever by the operator causes



the forks to grasp the load in a pincer-like movement. The forks are then lifted and the load transported or tiered as desired. The tilting Worksaver has a 3750-lb capacity, travels at 2 miles per hr under full load, and the mast tilts a full 21° in 10 sec to center the load. Fork elevation is 56½ in. *Yale & Towne Mfg. Co. For more information, check No. 16 on the attached postcard.*

Reversible Screw Driver

TO speed production jobs that require driving many small screws and other fasteners, a pneumatic reversible screwdriver, the Cleco A-1, scarcely larger than a fountain pen, has been designed that weighs 9½ oz and has no torque reaction. The balanced im-



compact mechanism absorbs the driving torque permitting finger-tip operation and control. There is no possibility of the tool twisting in the operator's hand or jumping out

of the screw slot. Since the throttle valve is opened by pressure on the bit, wasteful free running is eliminated. Rotation is easily reversed. *Reed Roller Bit Co. For more information, check No. 17 on the attached postcard.*

Scrap Truck

A SCRAP truck, designed to work with and increase the usefulness of a revolving head fork lift truck, consists of a bin-like superstructure made of heavy steel plate welded to a flat steel deck transport. Fabricated steel channels, built to accommodate the forks of lift trucks, extend from front to rear panels just above the transport deck. A hand jimmy can convert the stationary bin to an easily maneuverable hand truck. The truck is available with steel sides 20, 24, 28, 32, and 36 in. high with a corresponding capacity up



to 22 cu ft. By applying a stacking unit, the truck will stack upon itself or upon other units. *Factory Service Co. For more information, check No. 18 on the attached postcard.*

Heavy Duty Casters

FORGED steel heavy duty casters in 5, 6, and 8-in. diam wheel sizes feature an improved construction that utilizes the extreme strength of forged steel frame and top plate. The new line uses the unit type of enclosed main load bearings and Timken thrust bearings, and is recommended for operating loads of 1500 to 2000 lb. *Bassick Co. For more information, check No. 19 on the attached postcard.*

Variable Speed Control Unit

A NEW 1 or 2 hp 6:1 ratio variable speed control uses standard B belts, with fixed centers at any distance. The complete assembly includes two variable pitch sheaves and control. A spring-loaded sheave is mounted on the

motor shaft while the control sheave is mounted on the driven shaft. A regulating mechanism consisting of a hand wheel and bracket, adjustable to any application, opens and closes the control sheave. The changes in pitch diameter cause the V belt to actuate the spring-loaded motor sheave, thus giving stepless speed control over a 6:1 range. Remote control can be easily applied. *Speed Selector Inc.* For more information, check No. 20 on the attached postcard.

Casting Sealant

A NEW liquid resin for sealing porous, light metal castings has been developed to permit foundries to salvage castings that would otherwise be rejected because of porosity, and to permit their use on applications involving oil or vapor pressures. This material, called Permafil, is a polyester-type resin that converts to a tough, clear solid, free of voids, through the action of catalysts and heat. Castings are sealed by vacuum impregnation and a subsequent short oven bake. Permafil is said to have good storage life under recommended conditions. *General Electric Co.* For more information, check No. 21 on the attached postcard.

Foot Switch

A NEW Linemaster foot-switch features small size, high sensitivity and can be applied to a wide variety of interiors or wiring combinations. The actuating mechanism is fool-proof and so sensitive that it is equally effective for operation by foot, finger, knee or elbow. It is rugged, made of heavy gage steel, has a black crackle finish, a cork composition non-skid base, and weighs 6½ oz. *Simonds Machine Co.* For more information, check No. 22 on the attached postcard.

Pants Guard

A NEW pants guard made from Duck material completely encloses the pants cuff preventing any possibility of the cuff getting caught in machinery or gears. It extends 6 in. up on the ankle, and is fitted with two arctic buckles for adjustment, ease in putting on and for quick removal. *Safety Clothing & Equipment Co.* For more information, check No. 23 on the attached postcard.

High-Pressure Valves

FOR high pressure hydraulic service, new diaphragm-actuated two-pressure Merit valves can be used for oil or water. They range in size from 1 to 4 in. and can be furnished for operation on systems having 3000, 5000, and 10,000 psi pressures. Valves provide for shockless operation, rapid servicing, minimum frictional loss, and ready accessibility to all working parts. Capacities equal or exceed standard pipe areas. Variations of assembly provide for diaphragm-controlled high-pressure inlet, diaphragm-controlled slow-travel valve, or diaphragm-controlled stop valve, all handled within one casting and with minimum pipe connections. Seats and disks between main valve and check valve assembly are interchangeable. *Emmett Machine & Mfg. Inc.* For more information, check No. 24 on the attached postcard.

Packaging Material

SUITABLE for packaging durable goods such as hardware and machine parts, Tuf-Bord, an extra strong and rigid folding paper board, is made in four thicknesses, 0.020, 0.024, 0.028 and 0.032

in., in white, brown and colors. Its printing surface is suitable to multi-color and high gloss printing. Tear, tensile strength and rigidity tests show the material permits reductions in thickness and weight without impairment to the carrying qualities of the package. This board will withstand tremendous knocking around and rough usage, it is reported. *Robert Gair Co. Inc.* For more information, check No. 25 on the attached postcard.

Tack Welding Electrode

ELECTRODE No. 384 is designed for making high-speed tack welds on heavy weldments without the necessity of breaking the excess coating from the end of the electrode each time the arc is started. Sufficient dielectric strength is claimed to withstand scraping against the workpiece or ground without arcing through. Scrap cutting adaptability is also claimed because of concentrated and forceful arc. This electrode is 14 in. long in ⅛, 5/32, 3/16 in. sizes and 18 in. long in ¼ in. size. *Hobart Bros. Co.* For more information, check No. 26 on the attached postcard.

FIRST CLASS
PERMIT No. 36
(Sec. 510 P.L.&R.)
New York, N. Y.

BUSINESS REPLY CARD

No postage necessary if mailed in the United States

4c POSTAGE WILL BE PAID BY

THE IRON AGE

100 E. 42nd St.

NEW YORK 17, N. Y.

THE IRON AGE, New York 17, N. Y.

Send us additional information as circled below

1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24	25	26	27	28
29	30	31	32	33	34	35	36	37	38	39	40	41	42
43	44	45	46	47	48	49	50	51	52	53	54	55	56

NAME TITLE.....

PLEASE STATE BUSINESS.....

COMPANY

CO. ADDRESS

CITY ZONE..... STATE.....

6/9/49

1

Information Free . . .

A PORTABLE POWER BELT CONVEYER designed to be extended or retracted quickly at the will of the operator is described in Bulletin No. 220. The conveyer reaches into trailers, trucks, box cars, across platforms and is designed for jobs where it is desirable to change the point of discharge often. Illustrations show set-ups. *Standard Conveyor Co. For more information, check No. 27 on the attached postcard.*

INCREASING PRODUCTION without replacing or adding to existing equipment is explained in folder listing contract requirements of metal products and components. Subjects covered include engineering and designing; stamping, forming and drawing; welding; tinning, galvanizing and lead coating; vitreous enameling and spray painting. *Geuder, Paeschke & Frey Co. For more information, check No. 28 on the attached postcard.*

PROTECTIVE COATINGS of vinyl corrosion resistant material discussed in folder are for combating corrosion of metal, wood, stone, brick and concrete structures and equipment by atmospheric and chemical action. Coating is specifically recommended for use in corrosive atmospheres, coastal areas, and submersion in salt and fresh water. *Dennis Chemical Co. For more information, check No. 29 on the attached postcard.*

METAL CUTTING TOOLS for the aircraft and light metal industries are explained in supplement to catalog 16. The types include twist drills, reamers, counterbores, milling cutters, end mills and hobs. Styles are illustrated with complete specifications and prices included. The tools are specially recommended for aluminum and magnesium. *National Twist Drill & Tool Co. For more information, check No. 30 on the attached postcard.*

CERTIFIED COMBUSTION and its advantages are explained in bulletin 58. It is offered on one of the company's gas burners and features are listed as exact air-to-gas ratios set by a dial and pointer without further adjustment. Burner arrangements are shown in a series of diagrams. Positive initial light-up regardless of number of burners is claimed. *North American Mfg. Co. For more information, check No. 31 on the attached postcard.*

SPECIAL REFRACTORIES described in bulletin No. 202 are recommended for the construction of aluminum open-hearth melting furnaces, such as crucibles for melting and refining platinum and similar alloys. Their characteristics, applications and advantages are discussed. Recommended for glass, refining and chemical process industry. *Chas. Taylor Sons Co. For more information, check No. 32 on the attached postcard.*

HYDRAULIC PRESSES for forgings, stampings and plate forming are described and illustrated in catalog. Models include hydraulic column type, molding, steam platen, gap type and hydraulic straightening presses. Also illustrated are hydraulic welding rod and ceramic types. Specifications are listed. *A. B. Farquhar Co. For more information, check No. 33 on the attached postcard.*

TANGENT BENDERS, how they operate and what they produce, is explained in 28-p catalog. Single wing tangent benders designed for any style tangent bending are illustrated. Structural capacities are said to range up to 175 sheet metal bends per hr and to 1500 structural bends per hr. *Struthers Wells Corp. For more information, check No. 34 on the attached postcard.*

AIR TOOLS catalog lists and illustrates horizontal grinders, vertical grinders, sanders, shears, nibblers, wrenches, drills, screwdrivers and nut runners. Engineering features are explained and complete specifications are given. A light duty air grinder for die sinkers and tool makers is featured. *Buckeye Tools Corp. For more information, check No. 35 on the attached postcard.*

ROUGH GRINDING information in catalog includes wheel selection, grinding machines floorstand grinding, portable grinding and swing frame grinding. Also listed are data on finishing welds and stainless steel. Additional information covers mounted wheels and points with available shapes illustrated. Prices are listed. *Norton Co. For more information, check No. 36 on the attached postcard.*

WING NUTS claimed to look better and give better service are illustrated in leaflet which contains a dimension chart and tables of sizes. Two sizes are available. The nuts are made of zinc alloy and feature a recessed wing finger grip. Other products described include small zinc die castings and injection moldings. *Gries Reproducer Corp. For more information, check No. 37 on the attached postcard.*

CENTERLESS GRINDING WHEELS which are designed to be self-dressing are illustrated in folder which explains how they save time and increase production. Several case histories of continuous runs without wheel dressing are included. The wheels are made from tempered abrasive developed to grind tempered steel. *Mid-West Abrasive Co. For more information, check No. 38 on the attached postcard.*

FORGING RODS and shapes information listed in folder includes the chemical composition of ten brass and bronze alloys used and average physical properties of forgings made from them. Typical brass forgings are pictured to illustrate degree of workability. Machined forgings are also shown. *Titan Metal Mfg. Co. For more information, check No. 39 on the attached postcard.*

THE IRON AGE, New York 17, N. Y.

6/9/49

2

Send us additional information as circled below

1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24	25	26	27	28
29	30	31	32	33	34	35	36	37	38	39	40	41	42
43	44	45	46	47	48	49	50	51	52	53	54	55	56

NAME TITLE.....

PLEASE STATE BUSINESS.....

COMPANY

CO. ADDRESS

CITY ZONE..... STATE.....

FIRST CLASS
PERMIT No. 36
(Sec. 510 P.L.&R.)
New York, N. Y.

BUSINESS REPLY CARD

No postage necessary if mailed in the United States

4c POSTAGE WILL BE PAID BY

THE IRON AGE

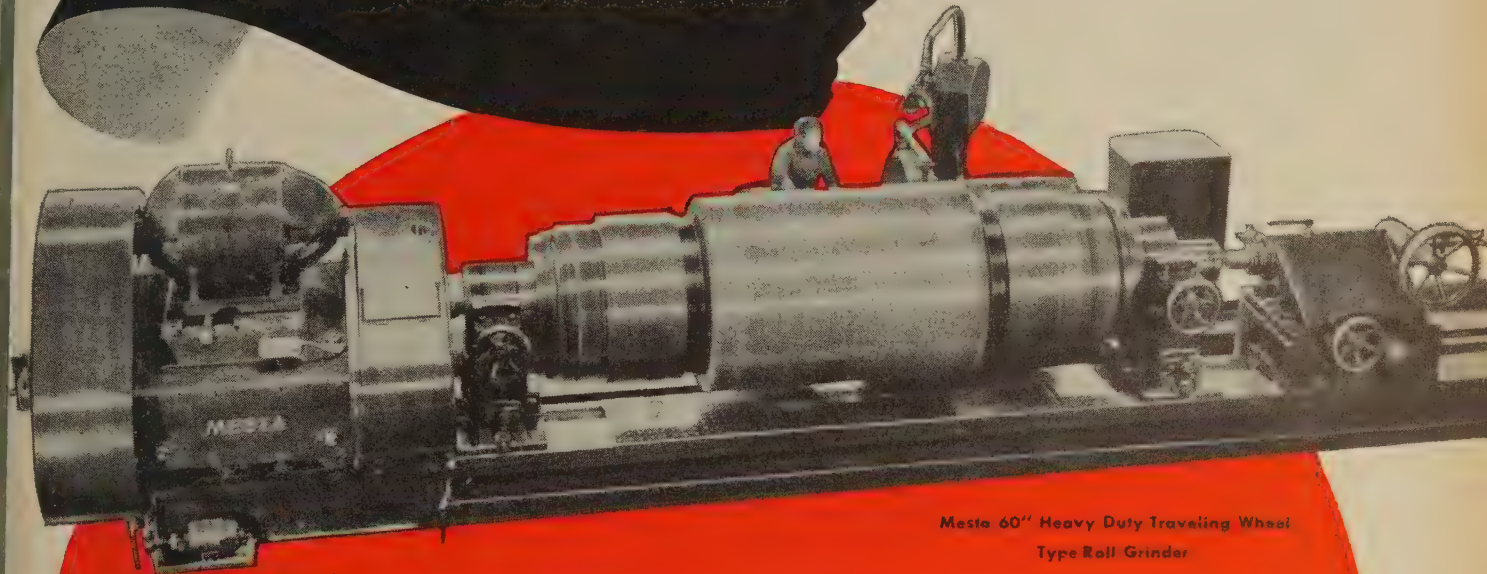
100 E. 42nd St.

NEW YORK 17, N. Y.

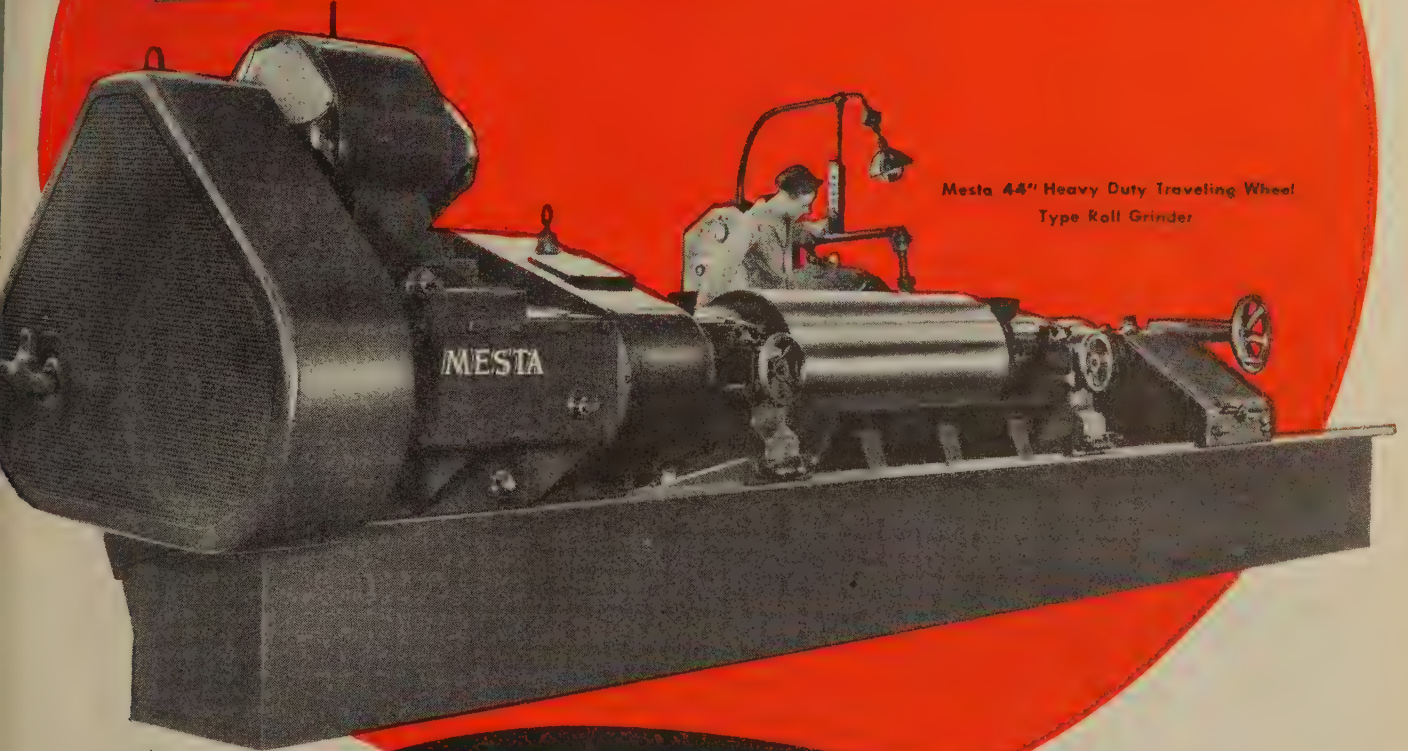
MESTA

Roll Grinders

Mesta Roll Grinders of simplified design are the most accurate and dependable grinding machines available today. Built with precision for the finest finishing and with ruggedness for the heaviest roughing.



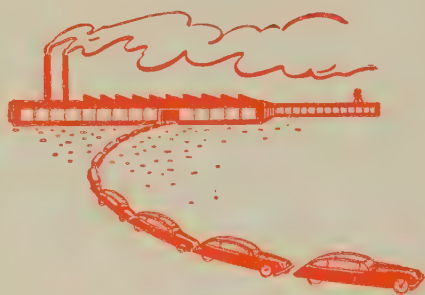
Mesta 60" Heavy Duty Traveling Wheel
Type Roll Grinder



Mesta 44" Heavy Duty Traveling Wheel
Type Roll Grinder

Designers and Builders of Complete Steel Plants
MESTA MACHINE CO., PITTSBURGH, PA.

• Auto engineers hold annual summer session at French Lick . . . Corrosion problems, gas turbines and GM's new Australian car are discussed . . . Round-table sessions consider problems of fatigue.



FRENCH LICK, IND. — Whatever may be the economic future of the automobile industry, its technical future is bright with possibilities for advancements that will be pleasing to both the motorist and the manager of an auto plant.

The practical possibilities for U. S. cars offering better resistance to corrosion, more efficient automatic transmissions, and more satisfactory metal processing and testing were adequately demonstrated during the 18 technical sessions held here this week.

Highlighting the list of technical papers and round table discussions were papers on Corrosion Problems of the Automotive Engineer by F. L. LaQue and E. J. Hergenroether; Corrosion of Electroplated Steel in Automotive Applications by H. A. Pray, Battelle Memorial Institute; the Packard Automatic Transmission by J. G. Vincent and F. R. McFarland of Packard Motor Car Co.; Gas Turbines in Automobiles by W. A. Turunen, Research Laboratories Div. of General Motors Corp.; and

Manufacturing an Automobile in Australia by W. E. Hill, General Motors Overseas Operations.

In addition to the usual technical papers, round table discussions were held on the following subjects of interest to the metalworking industry: Problems with Cast Iron Parts; Injury Done to Metals by Grinding; How to Prevent Wear; Fatigue and Service Testing of Automotive Parts; Machining and Machinability of Iron and Steel.

Space limitations prevent the possibility of discussing more than a few of the papers given here at this well-attended meeting.

In their paper on corrosion problems Mr. LaQue and Mr. Hergenroether point out that serious corrosion of auto bodies usually proceeds from underneath or inside the exterior surfaces. This is because these inner surfaces receive little attention from the user and are kept wet longer by splash and clinging mud. Where properly applied, the authors believe asphaltic undercoatings provide both corrosion protection and sound deadening. It is recommended, however, that the coatings be applied before delivering the car to the purchaser.

The authors believe that humidity of the atmosphere where a car is parked is a more important corrosion factor than salt thrown on the car from the highway.

"The most adverse factor in the corrosion of automobile underbodies is that they have limited opportunity to dry out," according to Mr. LaQue and Mr. Hergenroether. Atmospheric tests indicate that specimens exposed at an angle of 30° from the horizontal corrode appreciably more on the shaded groundward surface than they do on the skyward surface, the ratio being about 60 to 40 according to Mr. Larrabee. Similarly, specimens exposed in the shade under a partial shelter corrode more than those exposed boldly to rain and sun, reflecting the greater protective value of rust that has a chance to dry out.

THE authors suggest "the underbodies of cars should be designed with quick drying in mind." The possible use of air channels

and guiding vanes to insure an ample supply of drying air is recommended.

In the paper, the detrimental effects of sulfur on corrosion resistance as well as certain favorable inhibiting effects of additions of copper, nickel and chromium are discussed. "An indicated copper content of at least 0.05 pct will provide what should be considered as a barely satisfactory level of corrosion resistance," according to the authors. Sulfur should be held under 0.04, but with higher copper and nickel content, higher sulfur can be tolerated. It is disclosed that steels with combinations of nickel and copper not much above the usual residual content are currently being investigated.

Investigations by the authors indicate that all-nickel plating may be better than electro deposits of nickel and copper. In the case of decorated trim, it was found that resistance to rust staining increases progressively with alloy content and is enhanced by the copresence of nickel or nickel plus molybdenum or by a high degree of polish. It is stated that in corrosive atmospheres near the ocean, chromium plating over stainless has a slightly beneficial effect on resistance to rust staining. "However, it is unlikely that any composition of stainless steel that does not provide the desired level of resistance to atmospheric corrosion can be rendered satisfactory by the application of chromium plating in the thicknesses normally used for decorative purposes," the authors conclude.

Investigation of corrosion of mufflers and tail pipes showed that Inconel and stainless steel will eliminate the muffler and tail pipe corrosion problem. If the thickness of ordinary steel is doubled, the life of the part is doubled. Zinc coating adds little to the life of a muffler although coating with aluminum by hot dipping or aluminizing appears to at least double the life of the part. Coatings of lead-tin alloy had only slight effect; nickel zinc approaches aluminized steel; vitreous enamel coatings are highly effective where they can be applied.

It appears that driving habits

(Below) Removing thoroughly cleaned cylinder blocks from the monorail conveyor of the Wheelabrator Cabinet.



HOW WHEELABRATOR® saves \$110.16 per day



CLEANING CYLINDER BLOCKS

WHEELABRATOR MONORAIL CABINET
pays for itself from savings

In addition to saving in costs, this user* is experiencing cleaner working conditions, uninterrupted production and uniform high quality finish.

Our engineers will give you definite facts on the savings you can count on when a Wheelabrator is applied to your cleaning problems.

*Name on request.

Compare these Figures

OPERATION

FORMER METHOD
14 Tumbling Mills
1 Airblast Room (Monorail)

PRESENT METHOD
Wheelabrator Monorail Cabinet
(with three wheels)

PRODUCTION
125 cylinder blocks per hour

PRODUCTION
142 to 180 cylinder blocks per hour

LABOR
45 men for all cleaning operations
(shake-out gang, tumbling mill and airblast room operators, chippers and inspection crew).

LABOR
31 men for all cleaning operations
(shake-out gang, Wheelabrator operators, chippers and inspection crew).

COSTS AND SAVINGS

Labor, Power, Maintenance
Cost per block
Cost per 8 hour day

FORMER METHOD
\$ 56.68 per hour
.453
\$453.44

WHEELABRATOR
\$ 42.91 per hour
.238
\$343.28

SAVINGS

\$ 13.77 per hour
.215
\$110.16



New, information book gives complete, concise information on all phases of airless blast cleaning. Write today for Catalog No. 74-A.



American

WHEELABRATOR & EQUIPMENT CORP.

510 S. Byrkit St., Mishawaka 3, Indiana

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

have much to do with the rate of corrosion of mufflers and tail pipes. Short, house-to-house driving by doctors or short drives to work, for example, result in rapid deterioration of these parts.

Other subjects discussed by the authors include the effects of electric currents and weltings on corrosion; corrosion inside engine cylinders; corrosion in the cooling system; corrosion by lubricants and liner corrosion.

* * *

IN a paper, "Gas Turbines in Automobiles," W. A. Turunen of the Research Laboratories Div. of General Motors Corp. made a detailed comparison of the calculated performance of a gas turbine with our present automotive engines. Included in the discussion are the possible arrangements for installing a turbine, comparative fuel consumption, effects of operating temperature, future fuel economy and a direct comparison of horsepower and torque characteristics of the two types of engines. The author also discussed braking torque, gearing and bearings and electrical equipment.

Among the limitations of gas turbines for automotive power are a high rate of fuel consumption, particularly at part throttle; large space requirements; possible objections because of the exhaust; sensitivity of the turbine to changes in ambient temperature; and the large reduction gear ratio that would be required. The author also pointed out that lower first cost of a gas turbine is questionable and that a separate device might be re-

quired to produce adequate braking torque. He also said that automotive power requirements are usually too low to show turbines at their best advantage.

The author has been careful to point out, however, that the gas turbine has certain characteristics which might be very desirable in an automotive installation. These include maximum torque at standstill with uniform variation to maximum speed; the need for only one ratio change in the transmission; the fact that a clutch mechanism might not even be required.

It is also argued that the gas turbine would operate with a wide range of fuels; vibration problems would probably be minimized; the lubrication problem is comparatively simple and an electric ignition system would be required only for starting.

In his conclusion, Mr. Turunen emphasizes the fact that a new power plant for automobiles must not only be as good as the present power plants they are to supersede; they must actually be even better. The author also points out that the gas turbine of the future must compete against a gasoline engine that will certainly be improved in the years just ahead.

"Any turbine power plant must promise performance not only equal to present reciprocating engines but to the highly refined engine of the future," the author said. At the present time, he believes, there is some question as to whether the gas turbine can promise such performance.

THE thoroughness with which General Motors does things is amply illustrated in the paper delivered by W. E. Hill, assistant operations manager of GM Overseas Operations, here at the convention. The title of the paper is, "Manufacturing An Automobile In Australia."

Before undertaking to build a car in Australia, GM made a complete on-the-ground survey to determine the specifications for a car specifically tailored to meet Australian conditions. This study covered more than a year. It disclosed the car should be smaller than an American Chevrolet but larger than the smaller European cars. It should have more road clearance than the average car and should have better hill climbing performance in high gear than English cars. It should be made as dust proof as possible and should be extremely economical in fuel consumption.

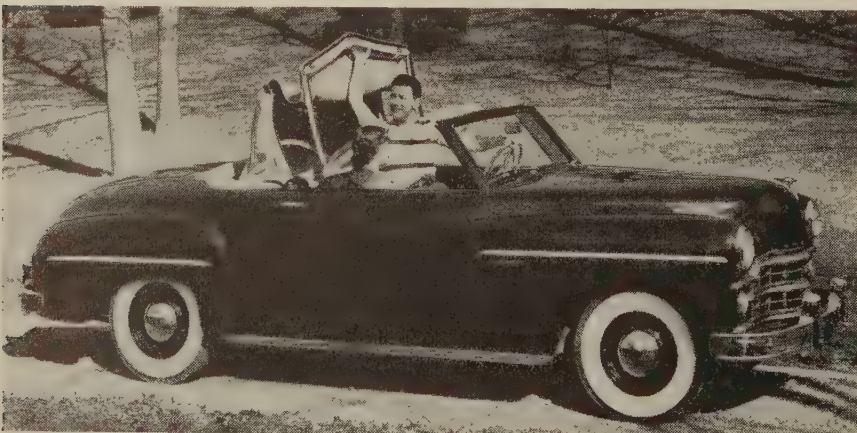
With these specifications in mind GM engineers and stylists went to work on the problem. Some 30 engineers and technicians from Australia were brought back to the United States during the development stages. After considerable study and development work, three cars were built and tested at the GM proving ground outside Detroit.

Meanwhile, manufacturing plants were designed and machinery was purchased and shipped to Australia. These included a foundry for making gray iron castings as well as necessary assembly plants. The author points out some difficulty has been encountered in obtaining from local producers malleable iron castings and forgings of the required standard. Items such as ball and roller bearings, carburetors, starting motors, brake linings, wheels and electrical equipment are being imported.

When the pilot models were satisfactorily proved in U. S. they were taken to Australia with the necessary GM personnel. The new plants were well under way when the pilot models arrived in Australia.

An 86-mile test course was laid out over which the three pilot models built in U. S. together with three more pilot models built in Australia were thoroughly tested. From time to time the cars were taken apart for inspection and changes were made in specifications as indicated by the tests.

COMEBACK: After an absence of 17 years a new Dodge roadster, the Wayfarer, is being put on the market again "at the lowest price of any full sized American car." The top frame work is aluminum rather than steel. The driver can raise the top without leaving the seat. Clear plastic windows, framed in aluminum, slip into pockets in the doors. The windows are carried in a compartment behind the driver's seat when not in use.



STOP RUST

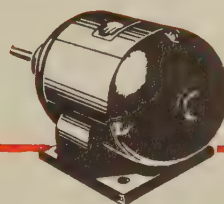
on raw stock



finished parts



completed assemblies



this **FREE** Booklet describes how

to save money, cut rejects
with

OAKITE *Special* PROTECTIVE OIL

Here are the facts on low-cost rust prevention to help improve operations and lower unit costs in every department of the plant. The complete technique of combating corrosion caused by humidity, acid fumes, finger-marks on raw stock; hand tools; work in process as well as parts awaiting assembly or shipment.

Oakite Special Protective Oil repels moisture without discoloring surfaces. Easy to apply and remove. Eliminates pre-drying when used on degreased or rinsed ferrous surfaces. Full, free details in this 16-page, free booklet.

WRITE TODAY

OAKITE PRODUCTS, INC., 28 Thames St., NEW YORK 6, N. Y.
Technical Representatives in Principal Cities of U. S. & Canada



Specialized Industrial Cleaning
MATERIALS • METHODS • SERVICE

• House Small Business Committee looks at steel distribution . . . Mr. Patman says new mills needed . . . Mines seen at focal point of attack by enemy . . . NSRB favors clearer, stronger policy.



WASHINGTON — The Congressional spotlight is again focusing on the steel industry. This time it is being directed by the House Small Business Committee, headed by Representative Wright Patman, D., Texas. The Texas legislator's committee is now engaged in a study of the pattern of steel distribution as related to sources of supply. The committee is gathering information which will show the various producing areas from which steel consuming industries normally draw their supplies in an effort to find out how much steel comes from these so-called "normal" areas and how much must be purchased outside such areas.

THE IRON AGE has learned that the study is aimed at determining what areas need steel producing facilities. While no longer concerned about the overall supply, there is a feeling in the committee that steel users are not getting their supplies most advantageously in relation to both price and location. The committee will also go into the whole pattern of produc-

tion and distribution and will look into integration, concentration and monopoly aspects, and the location of steel mills in the light of changes in the distribution pattern as a result of the wider dispersal of industry.

There is also some doubt in the minds of committee staff members regarding the direction of present expansion of the industry. It is felt that too much attention is being paid to rehabilitating old mills and absorbing independent producers instead of new construction in newly industrialized areas.

THE only hearing on the problem which the committee has held was in Dallas, on May 27. The sole witness was a committee investigator who presented testimony which strengthened Mr. Patman's long-range fight for expanded steel production facilities in east Texas. However, committee staff members maintain that the Dallas hearing set the pattern for additional hearings which will be concerned with steel distribution in other parts of the country. At these hearings it is expected that both steel producers and consumers will be called upon to testify.

At the Dallas hearing which was concerned primarily with oil country pipe and tubular goods the committee investigator who testified presented a great deal of data which lent weight to Mr. Patman's argument for an RFC loan to the Lone Star Steel Co.

In addition, as pointed out by staff members in Washington, there is no question but what the groundwork was laid for the overall investigation. For example: The investigator presented data which indicated the purchase by Texas consumers in 1948 of large quantities of steel from what is considered to be outside the normal supplying area for Texas. He claimed that some 2 million tons plus had to be bought outside this area at a freight disadvantage of \$14.50 a ton which allegedly ate away the profit of firms buying this steel. He also struck at integration within the industry and production of finished items by subsidiary

companies. Discussing the general growth of Texas in recent years, he told Mr. Patman that "if there were additional steel facilities in this area, it would definitely reduce the cost of construction in this part of the country."

REFERRING to the increase in capacity by Sheffield Steel, the investigator stated that more steel production would be advantageous to Texas. He declared that "other mills could come into the locality without disrupting their activities (Sheffield) in any way and would be a competitive factor, and have plenty of market for their products, principally in the manufacture of oil country goods and plate."

The committee is also plugging the national defense angle in its fight for new locations of additional mills. It was pointed out at the hearings that the crippling of the Soo Locks would drastically curtail a majority of the nation's steel output.

* * *

Being responsible for development of a mobilization plan that not only could be put into operation quickly and effectively but which would stand up under fire, the National Security Resources Board is centering a great deal of attention on domestic mining problems.

It is from oil wells and mines that come the basic materials for critical war production. Because of this fact, it is felt that mining would share equally with manufacturing and transportation industries any damage of swift and heavy attack by an aggressor.

While few will say so publicly, key people within the board who are concerned with mining phases of planning feel that this has been industry's sad sack or traditional stepchild. In the words of one official, the nation's mining policies "before, during and after World War II leave much to be desired."

WHAT the board would like to see is a well-defined and coordinated program which would provide for development of new



ONE OIL DOES TWO JOBS

One New Sunicut Grade with Petrofac* Replaces Two Oils, Gives Improved Performance and Lowers Costs

Parts: Knurled rise nuts for Stillson wrenches

Operation: Spot, drill, knurl, and cut off

Machines: New Britain Model 61's

Materials: SAE X1112 and X1113 Bar Stock

Tools: Rex AA High-Speed Tool Steel

Cutting Speed: 156 S.F.P.M.

Cycle Time: 9.9 seconds

Production: 363 pieces per hour per machine

A manufacturer of wrenches was using two oils in his automatic screw machines—a dark cutting oil

and a lubricating oil. Replacing both with one grade of new Sunicut with Petrofac, he found the way to many benefits. Savings have been substantial. Dilution of cutting oil through seepage is no longer possible. Drain-off from chips is increased. There is only one oil to buy, store and handle. Finish is better, tool life longer, work visibility improved.

Because the new Sunicut grades with Petrofac possess superior metal-wetting, antiweld and extreme-pressure qualities, they are giving outstanding performance throughout the metal working industry. They are not blended with animal or vegetable fatty oils—cannot turn rancid. For more information write for folder IA-6.

SUN OIL COMPANY • Philadelphia 3, Pa.

*In Canada: Sun Oil Company, Ltd.
Toronto and Montreal*

*Petrofac is a trademark of Sun Oil Company.

SUN PETROLEUM PRODUCTS

"JOB PROVED" IN EVERY INDUSTRY



sources (by subsidy, if necessary), a wise and equitable tax program, and not only a plentiful military stockpile of strategic and critical materials but a sizable reserve stock of mining equipment and spare parts.

Furthermore, while it is not ready to propose or even endorse such a proposal, the board would like to see set up, presumably on a standby basis, some sort of program for emergency manpower control which would assign "every usable person to the job where he or she is most needed." It feels that if real emergency came, there would be far too few miners available.

It is the privately expressed opinion of some board key personnel that it is likewise a poor policy to apply taxation to mineral (particularly iron ore) reserves as soon as they are uncovered, regardless of whether the ore is being removed from its bed. It would seem more practical from the board's viewpoint to work out a policy which would encourage, rather than discourage, uncovering and determination of the actual quantities of deposits.

Accumulation of a \$3 billion or more national stockpile is already

in progress, although somewhat behind schedule. It is felt and recommended that wherever the mining industry can do so, it should standardize equipment, accumulate a certain standby quantity, and maintain an "adequate" supply of spare parts.

In an effort to stir some action, the board has permitted the re-

lease to key people of government and industry a well-annotated survey of the domestic mining industry containing many of these conclusions. While the board warns that this does not "necessarily imply complete endorsement by the board," nevertheless the survey was made by a staff member and distributed by permission.

Government-Owned Magnesium Plant Sold To Wartime Operator

Washington

• • • The Government-owned magnesium plant at Freeport, Tex., which the Dow Chemical Co. operated jointly with its own plant during the war to produce 40,000,000 lb of magnesium metal per year has been sold to its wartime operator by the Federal Works Agency. Dow's private plant is adjacent to the Government's property and is now the only producer of primary magnesium in the United States.

Known as the Dow Magnesium Corp., Plancor 81, the plant was purchased by the Dow Chemical Co. of Midland, Mich., of which

the corporation was a subsidiary. The maximum cash benefits and services accruing to the Government are estimated to total \$1,987,700, broken down as follows:

Cash in the amount of \$608,000 and royalties amount was given to Gen. Fleming recently of 1¢ per lb on the first 40,000,000 lb produced by both plants; ½¢ a lb on the next 30,000,000 lb; and ¼¢ a lb on all production in excess thereof for 5 years.

The company will rehabilitate the plant estimated to cost \$212,000, maintain and keep same in ever-ready production condition at a \$477,000 estimated cost and to provide police and fire protection, utilities and other services calculated to total \$65,000, all for the 5-year period.

Not only will the company hold its privately owned plant in productive condition during the said 5-year period but will make available to the government, magnesium at the rate of 20,000,000 lb per year.

THE BULL OF THE WOODS

BY J. R. WILLIAMS



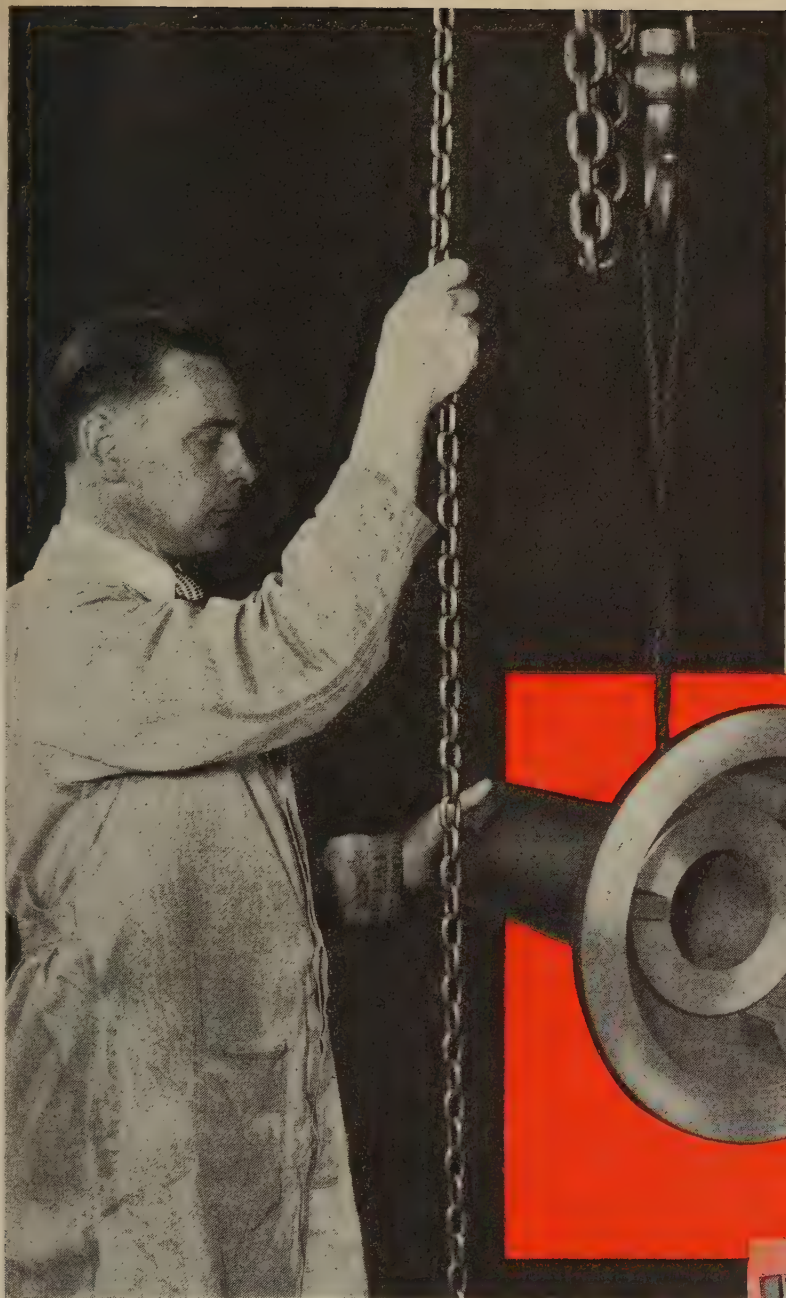
Changes Regulation For Export Wire Products

Washington

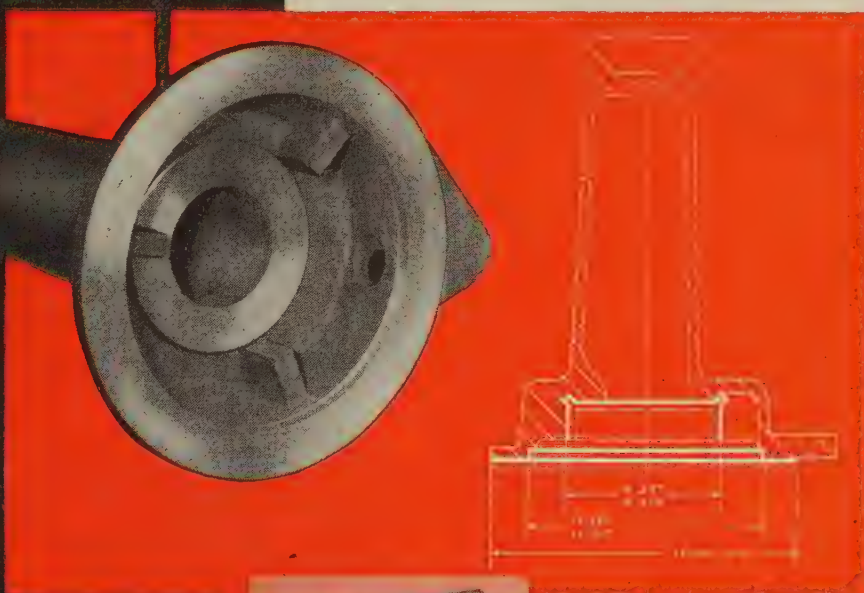
• • • Effective June 10, it is no longer necessary for exporters to submit special certification that an order has been placed by foreign purchasers after a specific date for barbed wire, woven wire fencing, wire rods, uncoated and galvanized wire, or concrete reinforcing bars.

Nor, says the Commerce Dept. order, will it be necessary to reconfirm such orders. However, exporters must continue to submit proof of firm orders with the original application.

At the same time, the Office of International Trade extended the filing date covering third quarter exports of aluminum sheet, plate, and strip, from the previous June 10 until June 20.

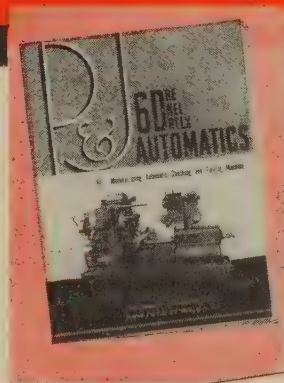


SOLVES A *housing problem*



REAR axle housing, that is. Note the size... the 45° angular recess... the number of operations (12) for rough and precision-finish boring, spading, chamfering, facing...

This class of work is a natural for the P&J Automatic; with this Machine tooled the P&J way, you have a most efficient setup for today's high-speed, close-tolerance requirements. When next you figure on the precision-production of quantity duplicate parts, give consideration to P&J's specialized know-how — and the profitable combination of P&J Tooling on P&J Automatics.

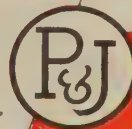


The P&J Tooling, to produce the work illustrated, was set up on the 6DRELX, one of the 6D series of P&J Automatics described in this Bulletin. Write for your copy. It may also pay to get a P&J estimate on your prints or sample parts. Either way, there's no obligation.

Potter & Johnston Company

Pawtucket, R. I.

subsidiary of Pratt & Whitney
Division Niles-Bement-Pond Company



PRODUCTION TOOLING HEADQUARTERS

• **San Francisco Bay Area industrial location study completed...Foreign pig noses out domestic competitors . . . Simple foundry smoke control announced.**



SAN FRANCISCO—Industrialists contemplating moving production facilities to the West or establishing branch plants here to meet the requirements of a growing market or to overcome the handicap of high freight rates, now have available a factual study of industrial locations in the San Francisco Bay Area which shows that there are now available 224,217 acres of vacant land suitable for such developments. All factors affecting the selection of a plant site have been carefully and impartially analyzed in each of the nine counties bordering San Francisco Bay. This study is believed to be the only one of its kind and scope with the exception of one made for an eastern city and was prepared by Robert P. Danielson, industrial planner, under the direction of San Francisco Bay Area Council.

Not only have the physical requirements of industry, such as topography, paved roads, rail facilities, power supply, etc., been documented and analyzed, but similar studies and reports have been made on tax rates, fire insurance, weather conditions and population distribution.

Of the nine counties studied, San Francisco County showed the highest percentage of industrial land now under occupancy with only 12 pct of all such property available for industry still vacant. San Mateo

County, just south of San Francisco County on the same peninsula, shows a vacancy of 84 pct or a total of 18,010 acres suitable for industrial development.

Available acreage is only the beginning of this study and detailed reports on each of the factors involved in selecting a factory site are documented and illustrated by maps. It is apparent that the entire project was conducted on a strictly impartial basis and where limiting factors such as scarce water or limited gas supplies exist no attempt has been made to gloss over such limitations.

While no effort is made to indicate specific sites for plant locations, sufficient data is presented in the 60 pages of text and charts to enable an industrialist to localize his investigations within any particular area which best meets his general requirements.

Army Purchases Austrian Pig Iron for Japan

San Francisco

••• With domestic pig iron in ample supply and indications that it will be more abundant when Kaiser Co. blows in its new furnace late this year, the trade is wondering if the recent purchase by the U. S. Army of 60,000 tons of Austrian pig from Japan is indicative of a trend.

The contract for 60,000 tons of basic pig iron awarded to the Far East Metal Corp. of this city, headed by Hans Popper, was an inviting plum at this time for domestic producers. The bid of Kaiser Co. Inc. of \$63.67 per gross ton was only a little above the \$61.64 bid of Alan Wood Steel Co. but considerably higher than the bids of World Commerce Corp., \$59.79, and Horgan Fuel, \$59.97, and of the contract winner of \$55.75. The three lowest bids were for Austrian iron, and Far East is now shipping the metal from Linz, Austria, directly to Japan. This company also sold the government 30,000 tons of pig in 1948.

An analysis of the bids on this latest export sale indicates that

domestic producers were loath to reduce their selling price, much if any, below their present domestic price and that they were unable to make themselves competitive by securing low enough shipping costs. The Far East is making shipments in chartered vessels.

With both steel ingot and iron foundry production at the lowest point in many years on the Coast, pig iron is readily available even though production of the furnaces in Utah operated by Kaiser & Frazer Parts Corp. has ended.

Assures No Production Cuts for Geneva Steel

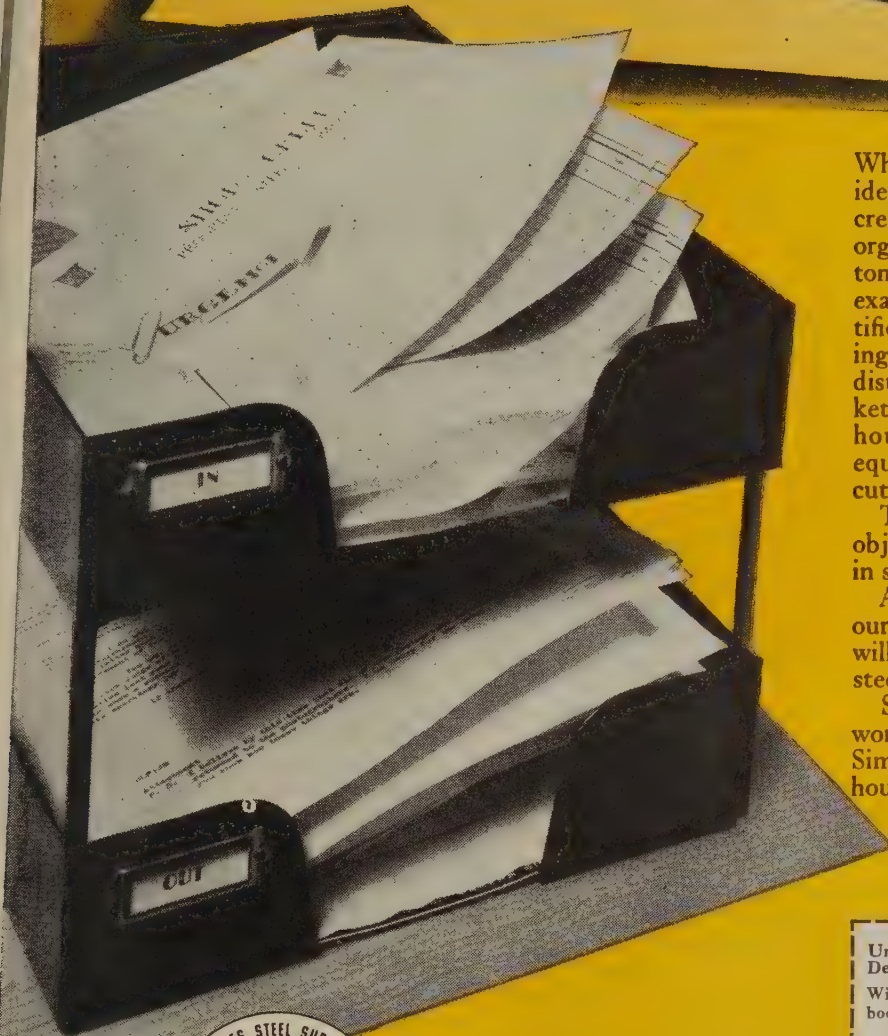
Salt Lake City

••• The people of Utah received a welcome assurance last week from Irving S. Olds, chairman of the board of U. S. Steel Corp., and Dr. Walter Mathesius, president of Geneva Steel Co., that no production cutbacks are in the cards for Geneva in the foreseeable future. The officials stated that no plans are in the making to shut down the blast furnace at Ironton. Some concern had risen locally over this operation because of the recent shutdown of the Kaiser & Frazer Parts Corp. Ironton furnace.

Some changes in production schedules to meet changing market conditions will be made from time to time, they pointed out. One such change has already been made by cutting the structural mill from two turns to one turn a day. At the same time a compensating increase was made in the production of hot-rolled coils. The men in the structural mill, working only 4 days per week there, have been given the privilege of working the fifth day in the plate mill if they so desire.

Mr. Olds was in Salt Lake City to address a joint dinner meeting of the Assn. of Stock Exchange Firms and the Salt Lake Chamber of Commerce. He devoted part of his address to explaining why directors cannot please government, labor, customers and stockholders in disposing of current earnings of the corporation.

When you need steel... *TRY US FIRST*



When you need steel, it's always a good idea to try us first. We are constantly increasing our facilities and expanding our organization in order to serve our customers more quickly and efficiently. For example, new warehouse buildings, scientifically laid out to speed zoning and loading, have been erected in a number of our districts. In several other important marketing areas we have opened new warehouses. And all our plants are being equipped with the latest machinery for cutting, processing and handling materials.

This progressive planning has but one object in view—giving you the very best in steel warehouse service.

As rapidly as possible, we are increasing our stocks. If you will check with us, you will find that many grades and types of steel are now available for prompt delivery.

So, try us first—for steel—for metal-working tools, supplies and machinery. Simply telephone, wire or write the warehouse or sales office nearest you.

Your inquiries for literature covering Stainless, Alloy and High Strength Steels will be given prompt attention. You're under no obligation.



SYMBOL OF SERVICE

FOR STEEL USERS

United States Steel Supply Company
Dept. DD-6-9, 208 S. La Salle St., Chicago 4, Ill.

Without obligation on our part, please send us free booklets on the U-S-S Steels checked below:

☐ Stainless ☐ Alloy ☐ High Strength

Name.....Title.....

Firm Name.....

Address.....

City.....Zone.....State.....

UNITED STATES STEEL SUPPLY COMPANY



Warehouses: BALTIMORE • BOSTON • CHICAGO
CLEVELAND • LOS ANGELES • MILWAUKEE • MOLINE, ILL. • NEWARK • PITTSBURGH
PORTLAND, ORE. • SAN FRANCISCO • SEATTLE • ST. LOUIS • TWIN CITY (ST. PAUL)
Also Sales Offices at: KANSAS CITY, MO. • PHILADELPHIA • TOLEDO • TULSA • YOUNGSTOWN
Headquarters Offices: 208 S. La Salle St.—Chicago 4, Ill.

UNITED STATES STEEL

It is up to the directors, he concluded, to exercise their best composite judgment and take the action that seems best for the corporation, keeping in mind that it is not a creature of the moment but a continuing enterprise of large potential importance to the nation.

Public Construction Up

Salt Lake City

••• Public construction is providing a welcome cushion for steel fabricators in this area whose private enterprise orders have been shrinking at a disturbing rate. One major fabricator reports that he is able to keep his entire organization together and his operations up to normal only because of orders for such projects as hospitals and schools. Pipe for transmission lines, a product that was in hectic demand a few weeks ago, has suffered a severe slump. Not only has new business virtually evaporated, this fabricator reports, but carloads are being offered for sale in the area by oil companies who have abandoned or postponed projected jobs.

The public projects are benefiting costwise by the situation as the fabricators, concerned about meeting overhead and keeping organi-

zations together, are really bidding competitively.

Discovers Process to Reduce Smoke Output

Los Angeles

••• Discovery of a simple process to form a crust of slag on molten brass and reduce smoke output may result in the saving of several hundred thousand dollars for small foundries in the congested Los Angeles industrial areas.

Experiments are continuing, but preliminary results indicate that the slag crust will substitute for costly bagging and other equipment previously thought necessary to combat air pollution and the resulting smog in Los Angeles County.

The process, which officials say is good only for small operations, has been proved successful for brass foundries and work is beginning on similar experiments for gray iron, steel and aluminum foundries. There is little reason to believe that similar processes cannot be evolved for them.

"All that is required for the new smoke reduction process is good housekeeping, the addition of small quantities of slagging material to melting pots, and careful supervi-

sion," according to Robert Haley, Los Angeles brass and aluminum foundryman who developed the program.

The slagging material used in the experiment is a trade-marked silicate ground extremely fine. There is a possibility that ground glass might fill a similar role.

Until now, it had been believed necessary to install some type of bagging equipment to take off the clouds of zinc oxide smoke which are produced in normal melting processes when molten metal flares as a result of its contact with oxygen in the air.

"This should prove a boom to hundreds of small foundries in the metropolitan area of Los Angeles," Mr. Haley said, "as it reduces the smoke output as required by the new county law, but does not involve installation of expensive equipment."

Some foundries had received bids of \$10,000 for bagging equipment with most of them likely to have to pay as much as \$20,000 or \$30,000.

The slagging process was demonstrated to Dr. Louis C. McCabe by the Peabody Co., Inc., of Los Angeles and received the official approval of the air pollution control director who has resigned effective July 1.

Possible procedures which might be used to save money for large foundries also are being explored. Most of the several hundred foundries in the area, however, are small.

New House for Northwest

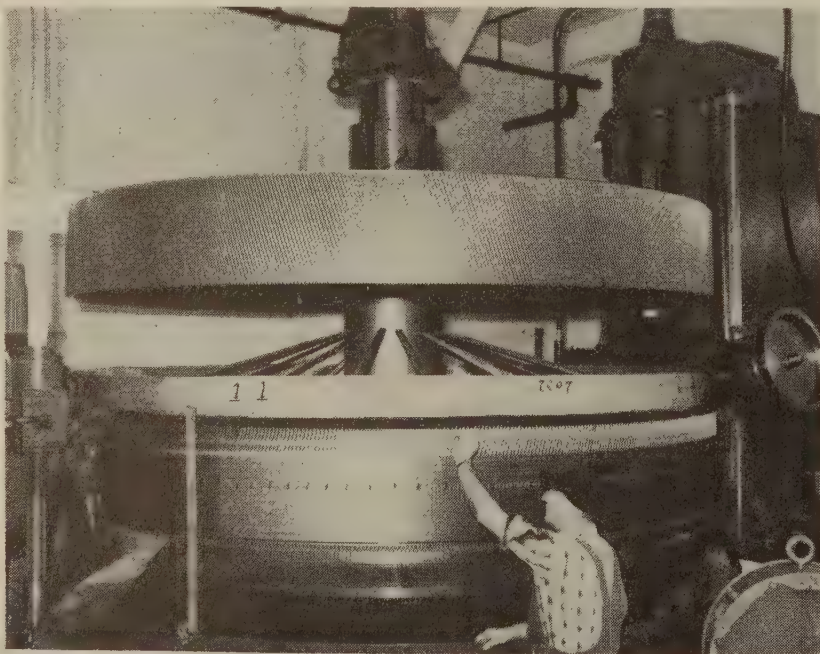
Seattle

••• Something new in the line of housing for the Northwest—a metal, glass and plaster house in the economy bracket—is under way in Seattle, sponsored by the Northwest Plaster Bureau.

Two houses of this type are being constructed in the Park Wood area with the cooperation of Albert Balch, builder, as part of the builders and architects economy-housing program.

The homes include two or three bedrooms and a general purpose room which might be used for a bedroom. Metal and gypsum lath, metal window frames and reinforcements, solid 2-in. plaster partitions and colored plaster both inside and out are some of the main features.

HOBGING: Hobbing of large bull gears for ship propulsion must be carried on with extreme accuracy. In this illustration showing construction of a bull gear at the Sunnyvale, Calif. plant of Westinghouse Electric Corp., teeth are completed on the upper wheel and hobbing has just been started on the lower wheel.



MULTIPRESS^{*} now offers amazing new HARMONIC STOCK FEED

*T.M. REG. U.S. PAT. OFF.



up to
50,000
parts per hour!

**Standard Multipress
equipment attains
high-speed produc-
tion records with
smooth, die-saving
hydraulic operation**

HIGHLIGHTS

- Stepless variation for all adjustments. No fixed speed or feed characteristics
- Velocity of punch-contact relatively slow (harmonic motion) adding to die life
- Feeding motion positively synchronized with that of press ram
- Smooth acceleration and deceleration of harmonic motion—LOW MAINTENANCE
- Adjustable stroke length permits shortest cycling time for each job—higher speed
- Die pile-up will not damage either press or dies
- Compact size
- 3" Maximum strip width . . . 3/64" maximum stock thickness . . . 3" maximum feed stroke

Multipress scores again. For the first time, smooth hydraulic press action can be coupled with a high-speed, fully automatic method of feeding continuous metal strip to forming, blanking, punching or drawing dies. Feed and press ram interlock in complete harmonic motion. Their synchronized operation is smoother, easier. Starts and stops are made in a *smooth flow* of acceleration or deceleration. There's less wear on dies and equipment. Maintenance costs are cut to the bone!

Stepless variation of feed rate and ram stroke, throughout the entire range of either, is another big advantage. A quick, easy adjustment sets ram stroke at minimum length for each operation. Result: faster production through minimum cycling time for every job.

Die pile-ups won't damage either the press or the dies. Force is exerted upon contacting work—regardless of height above the die. If you can't avoid pile-ups, you can avoid consequent damage, through use of the Multipress and Stock Feed Accessory.

Compactly engineered into amazingly rugged, space-saving units, Denison's Harmonic Stock Feed accessory for the Multipress is available in several models. We'll be glad to give you full details, in terms of your own requirements!

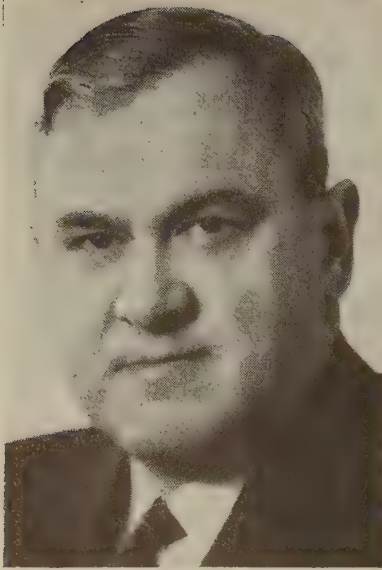
DENISON
HydrOILics

Write, wire, or phone for details today!

The DENISON Engineering Co.
1158 Dublin Rd., Columbus 16, Ohio

PERSONALS

• • •



WILLIAM C. KEELEY, president, Vanadium Corp. of America.

• **William C. Keeley** has been appointed president and chief executive of the Vanadium Corp. of America, succeeding **E. D. Bransome**. Mr. Bransome continues to serve on the board and on the executive committee. Mr. Keeley has been a director of the Vanadium Corp. since 1936 and a member of the executive committee since 1940.

• **J. B. Johnson** has resigned as vice-president and general manager of Bryant Chucking Grinder Co., Springfield, Vt., but continues as a director of the company. **J. H. Beardsley** has been appointed general manager. Mr. Beardsley has been associated with the Bryant Co. since 1946 when he became director and clerk of the corporation. Since 1948 he has been assistant to the president.

• **James H. Fraser** has been promoted to manager of engineering at the research and engineering laboratory of the International Business Machines Corp., Poughkeepsie, N. Y. Previously he had served as assistant to the vice-president. Mr. Fraser has been associated with the company since 1932.

• **Jack M. Lutz** has been appointed assistant to the president of Continental Foundry & Machine Co., East Chicago, Ind. Mr. Lutz has been engaged for many years in steel industry sales.

• **Peter A. Reynolds** has been appointed Chicago district senior service metallurgist for Carnegie-Illinois Steel Corp., succeeding **F. O. Cooper**, who has retired after 44 years with the company. Mr. Reynolds joined Carnegie as a metallurgical trainee in the sheet division at the Gary Sheet & Tin Mills in 1937.

• **Clarence C. Johns** has resigned as division manager of Columbia Steel Co. at Portland, Ore. Mr. Johns was appointed manager of the Oregon division in 1935 and has been affiliated with steel fabrication and sales on the West Coast since 1920.

• **Mead W. Batchelor** has been promoted from vice-president in charge of production to executive vice-president of Bridgeport Brass Co., Bridgeport, Conn. Mr. Batchelor joined Bridgeport Brass in 1933 and had previously been associated with Revere Copper & Brass Inc.

• **Frederick E. Schuchman** has been elected president and treasurer of Homestead Valve Mfg. Co., Coraopolis, Pa. **J. E. Roth** has been appointed chairman of the advisory committee. **W. R. Schuchman**, has been elected chairman of the board. **N. E. Kolesar** is assistant treasurer and **Bradley McCormick**, secretary.

• **Albert B. Agnew** has been made vice-president in charge of operations of all plants of the Laclede-Christy Co., St. Louis, and all subsidiary companies. Mr. Agnew has been vice-president and general manager of Laclede Christy of Pennsylvania, a wholly-owned subsidiary, for two years. He had formerly been associated with Harbison-Walker Refractories Co. for over 30 years.

• **R. Bruce McKenzie** has been appointed sales engineer covering the state of California for the Butterfield Div., Union Twist Drill Co., Derby Line, Vt., with his headquarters in Los Angeles.



J. W. KINNEAR, JR., president, Firth Sterling Steel & Carbide Corp.

• **J. W. Kinnear, Jr.** has been elected president of Firth Sterling Steel & Carbide Corp., McKeesport, Pa. The promotion follows Mr. Kinnear's service as executive vice-president, in which position he served for nearly two years and his 15 years of service as a director. Mr. Kinnear succeeds **L. Gerald Firth**, who has been president since 1933.

• **Leigh Willard** has been elected a member of the board of directors of ATF Inc., Elizabeth, N. J.

• **Allan F. Hardy Jr.** has been appointed plants engineer and a director of the Norton Co., succeeding **Clarence W. Daniels**, who has retired after 36 years with the company.

• **E. E. Routh**, vice-president, director of sales, has retired from Mathieson Chemical Corp., New York. **D. W. Drummond** has been appointed vice-president, director of industrial chemical sales, and **S. L. Nevins** has been named vice-president, director of agricultural chemical sales. **J. O. Logan** has been made sales manager, industrial chemicals; **R. J. Quinn**, assistant sales manager, industrial chemicals; **L. P. Thomas**, southwestern sales manager, industrial chemicals; **J. S. Whittington**, sales manager, agricultural chemicals. Mr. Thomas has his headquarters in Houston. Mr. Quinn and Mr. Whittington are in Baltimore.

They're both **LOK-THRED**

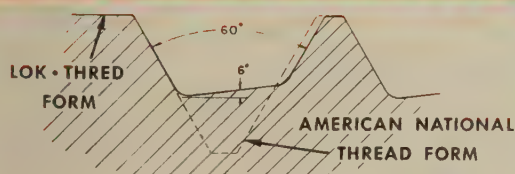
**NOW . . . get Lok-Thred's
greater strength . . more positive
locking action . . in any size
stud, bolt or screw**

Are you making full use of LOK-THRED'S proved advantages—and its availability in any size or type of threaded fastener?

The revolutionary LOK-THRED design locks securely and becomes tighter in service . . . has much higher fatigue limits and is stronger in both tension and torsion than ordinary American National Threads...does not require selective fits.

These and other LOK-THRED features may offer important application advantages in your products. For full information, write for LOK-THRED booklet, today.

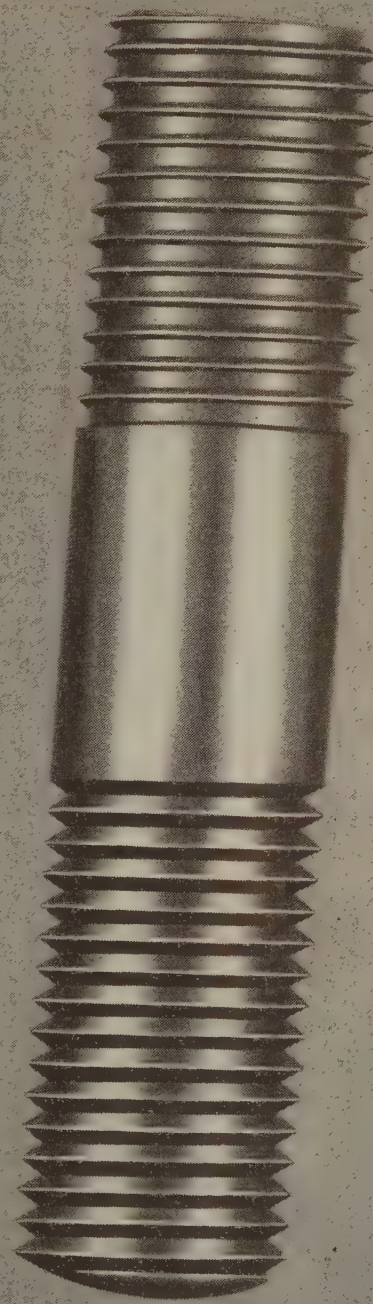
SEE THE DIFFERENCE!



Note Lok-Thred's larger cross section . . . and flat root surface instead of a relatively sharp "V" . . . as compared to the American National Thread form. Here's the secret of Lok-Thred's greater strength.



Shown
Actual Size



THE NATIONAL SCREW & MFG. CO.
Cleveland 4, Ohio

Pacific Coast: National Screw & Mfg. Co. of Cal.
3423 So. Garfield Ave., Los Angeles 22, Cal.



GEORGE L. MEYER, JR., vice-president and director, Stewart-Warner Corp.

• **George L. Meyer, Jr.**, a vice-president of Stewart - Warner Corp., Chicago, since 1941 and an employee since 1907, has been elected to the board of directors, filling a vacancy created by the death of **Ralph M. Shaw**. Mr. Meyer is president of the Bassick Co., Bridgeport, Conn., a Stewart-Warner subsidiary, and also heads the Bassick - Sack division at Winston-Salem, N. C.

• **H. E. Heywood, Jr.** has been named assistant chief engineer of the Toledo plant of National Supply Co., Pittsburgh.

H. E. HEYWOOD, JR., assistant chief engineer, National Supply Co.



• **Joseph J. Folz** has joined the Horace T. Potts Co., Philadelphia, as a technical specialist on stainless steel tubing and fitting problems. He had previously been associated with American Engineering Co., American Aniline Co. and E. I. duPont de Nemours & Co. Inc.

• **Robert A. Morris** has resigned as assistant to the president, Acme Steel Co., Chicago, in order to devote full time to his new responsibilities as president of Fergus-Lander Mfg. Co., Chicago.

• **Louis J. Shuster**, assistant treasurer, has been appointed assistant secretary of the Chase Brass & Copper Co., Waterbury.

• **Tolbott G. Shipley** has been appointed district manager of the St. Louis car plant of American Car & Foundry Co., New York. Mr. Shipley has been with ACF since 1913. He has been acting district manager since 1948.

• **A. A. Cambria** has been appointed director of sales at Progressive Tool & Die Co., Worcester. He had formerly been New England district manager of U. S. Broach Co.

• **Benjamin Steverman** and **Charles Tibbits** have been appointed industrial salesmen and **John Grotzinger** has been named field engineer, Taylor Instrument Companies, Rochester, N. Y. Mr. Steverman had previously been associated with General Electric, Combustion Controls Corp., Photo-switch, Inc., and J. K. Munhall Co. Mr. Tibbits had recently been doing service work for the company in the Cleveland territory. Mr. Grotzinger had been in the Cleveland territory for the past two years.

• **David G. Anderson** formerly consulting foundry engineer for the National Foundry Assn., Chicago, has opened his own consulting service to the foundry industry, operating from Clarendon Hills, Ill. Mr. Anderson served in engineering and operational supervisory positions in a number of the largest foundries prior to serving the Western Electric Co., as foundry engineer for 21 years.



JOHN E. CARROLL, general sales manager, American Hoist & Derrick Co.

• **John E. Carroll** has been appointed general sales manager of American Hoist & Derrick Co., St. Paul. Mr. Carroll started with American Hoist in 1937, later resigned his sales position there and became associated with Harron, Rickard & McCone Co. of Southern California, heading the construction equipment division.

• **Arthur J. Wieland** has been appointed vice-president and general manager of Ford International, Inc., New York. Mr. Wieland, who recently resigned as executive vice-president of Willys-Overland Motors, Inc., has been associated with the automotive industry since 1925. In 1948 he was elected chairman of the board of Wilson Foundry & Machine Co.

• **George Russell** has been appointed finance manager of General Motors Overseas Operations division, Detroit. He has been assistant treasurer of the G.M. Corp. since 1944 and has been a member of the financial staff since 1927. **Howard W. Megee** has been appointed assistant treasurer of the corporation, succeeding Mr. Russell. Mr. Megee has been with G.M. since 1926. He has been associated with the treasurer's office in New York since that time and has been director of the financial analysis section since 1944.



JOHN L. HALLETT, general manager, Kaiser-Frazer Corp.

• **Michael Miller** has been promoted to vice-president and executive assistant to the president of Kaiser-Frazer Corp., Willow Run, Mich. **John L. Hallett** has been appointed general manager. **John H. Tacke** succeeds Mr. Hallett as works manager.

• **Curtis C. Gary** has been appointed assistant to the president of the Brake Shoe and Castings division, American Brake Shoe Co., New York.

• **James H. Jewell**, manager of apparatus sales and **John M. McKibbin**, assistant to vice-president and manager of advertising and sales promotion, Westinghouse Electric Corp., Pittsburgh, have been appointed vice-presidents of the corporation. **Herbert P. MacDonald**, treasury manager in the company's eastern district office in New York, has been elected assistant treasurer. Mr. MacDonald has also been appointed credit manager of Westinghouse and has his headquarters in Pittsburgh. Mr. Jewell and Mr. MacDonald have been with Westinghouse since 1920. Mr. McKibbin joined the sales promotion department in 1922. **William L. Lane** has joined the lamp division of Westinghouse as a special sales representative, with headquarters in Chicago. Mr. Lane had been manager of the industrial sales department of Sears, Roebuck & Co. for 27 years.

• **I. B. Anderson** has been named sales manager of the steel products division of the West Virginia Steel & Mfg. Co., Huntington, W. Va. Mr. Anderson has been connected with the steel industry for many years, having been associated with the American Sheet & Tin Plate Co. of the U. S. Steel Corp., the Wood Works of the Carnegie Illinois Steel Corp., and the Corporation's stainless steel division. From 1945 until recently, Mr. Anderson served as manager of the stainless steel division of Jessop Steel Co.

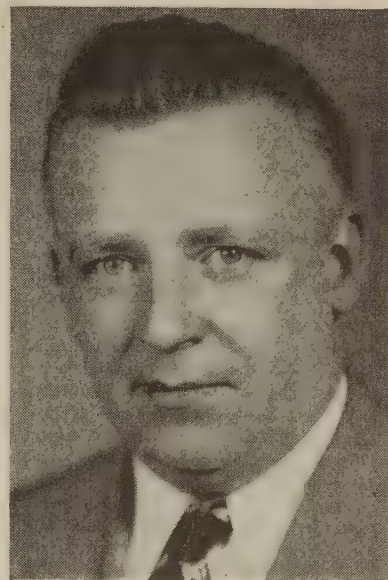
• **Edwin E. Parker** has been appointed manager of engineering of the turbine divisions, apparatus department, General Electric Co., Schenectady, succeeding Glenn B. Warren. Mr. Parker served as divisions engineer of the turbine and generator engineering divisions since 1947.

• **Wilfred L. Kelley** has joined the distributor sales department of the radio division of Sylvania Electric Products Inc., New York, operating out of the Chicago office. Mr. Kelley had formerly been equipment engineer for Western Electric Co.

• **H. L. Montgomery** has been named mechanical goods district manager of a newly-created district for the Goodyear Tire & Rubber Co., Cincinnati. Mr. Montgomery joined Goodyear in 1925. Since 1938 he has been in mechanical goods sales in Detroit.

• **I. C. Maust** has been appointed sales manager of the Precision Gear division of Foote Bros. Gear & Machine Corp., Chicago. Mr. Maust joined Foote Bros. in 1946. Prior to his new appointment, Mr. Maust had been sales administrator.

• **E. E. Esgate** has been named assistant to the general manager, Thew Shovel Co., Lorain, Ohio. Since 1947, Mr. Esgate has been active in the development of equipment and methods of operation for use in production and handling pulpwood by the pulp and paper industry, as a staff member of the industry's association and as an independent consultant operating E. E. Esgate Associates, New York.



I. B. ANDERSON, sales manager, Steel Products Div., West Virginia Steel & Mfg. Co.

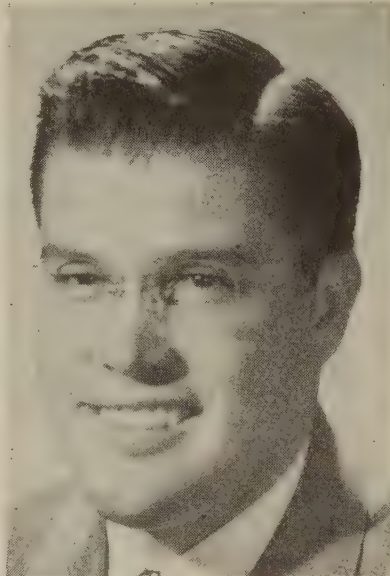
• **Medley G. R. Whelpley** has been elected chairman of the Warren Foundry & Pipe Corp. New York.

• **Philip E. Whiting** has been appointed eastern district manager of the Automatic Transportation Co., Chicago, heading the newly-established factory branch sales office and parts and service depot in New York.

• **James S. Corbin** has resigned as eastern division sales manager of the James Flett Organization, Inc., New York.

E. E. ESGATE, assistant to general manager, Thew Shovel Co.





FRED T. MILLER (left), and R. A. STUMM, JR. (right), vice-presidents, Burbank Div., Adel Precision Products Corp.

• **Fred T. Miller and R. A. Stumm, Jr.**, have been elected vice-presidents of Adel Precision Products Corp., Burbank, Calif., and Huntington, W. Va. Mr. Miller who has been associated with Adel for 8 years, had previously served as general sales manager. He is now vice-president in charge of engineering and sales at the Burbank division. Mr. Stumm, previously assistant to the president, has been appointed vice-president in charge of manufacturing in the same division. Mr. Stumm joined Adel in 1946 as purchasing agent.

• **Raymond J. Casey** has been appointed coordinator of industrial relations and training of the Midvale Co., Philadelphia.

• **Walter R. Coley**, a vice-president of Leeds & Northrup Co., Philadelphia, has retired after 43 years with the firm. Mr. Coley joined the company as an instrument maker in the galvanometer section of the laboratory. Since 1944 he has been vice-president in charge of production.

• **George S. Chiamonte** has been appointed assistant sales manager of the E. Horton & Son Co., Windsor Locks, Conn. Mr. Chiamonte covers the Cleveland and Pittsburgh areas, and has his headquarters in Cleveland.

• **Arthur M. Jorgensen** has been appointed sales engineer for Magnolia Metal Co., Elizabeth, N. J., covering the Wisconsin-Minnesota territory. He had formerly been associated with Battelle Memorial Institute as research engineer.

• **Thomas Rankin** has been appointed manager of the accessories department of Metal Goods Corp., St. Louis, succeeding **Carl Garfinkel**, who left the company for reasons of health. Mr. Rankin has most recently been a partner in the advertising firm of Eggers-Rankin.

• **Larry R. Butler** has been appointed sales representative in the San Joaquin Valley in California, and **Robert B. Franklin** has been named to cover Arizona, New Mexico and western Texas for Ziegler Steel Service Co., Los Angeles.

• **Richard K. Valentine** has been appointed consultant in manufacturing, McKinsey & Co., New York. Mr. Valentine had formerly been associated with the Shovel & Crane Div., Lima-Hamilton Corp., as an industrial engineer.

• **James MacNaughton**, 85, former president, Calumet & Hecla Consolidated Copper Co., Calumet, Mich., died May 26.

• **Albert W. Todd**, 65, president, United Shoe Machinery Corp., Boston, died May 26.

• **Charles O. Barks**, 75, retired superintendent of Sloss-Sheffield Steel & Iron Co., Birmingham, died May 21.

• **John H. Allman**, 80, formerly general manager of Standard Steel Car Co., Pittsburgh, died recently.

• **Hugh J. Wynn**, formerly district sales manager, Philadelphia & Reading Coal & Iron Co., Rochester, N. Y., died recently.

OBITUARY...

• **Charles F. Newpher**, 60, executive vice-president, National Screw & Mfg. Co., Cleveland, died May 15.

• **James O. Carr**, 76, attorney and member of the board of directors, Allegheny Ludlum Steel Corp., Pittsburgh, died May 23.

• **Percy T. Laws**, 74, retired former general manager of the U. S. Pipe & Foundry Co., Birmingham, died May 28.

• **Henry W. Kimmel**, vice-president, Taylor Instrument Co., Rochester, N. Y., died May 26.

• **Herbert W. Jones**, 50, vice-president, Chatco Steel Products, Chat-ham, Ont., Canada, died recently.

• **William E. Lyon, Jr.**, 86, retired structural steel contractor, founder and secretary of the Iron League of N. Y., died May 30.

• **John D. Vreeland**, 76, member of the board of directors, Ulster Iron Works, Dover, N. J., died May 30.

• **George Harris, Sr.**, 89, vice-president, Harris Structural Steel Co., New Market, N. J., died May 29.

• **W. W. French**, advertising and sales promotion manager, Dodge Mfg. Corp., Mishawaka, Ind., died May 6.

FINE TUBING FINISH

... boosts antenna beauty

PROBLEM: The L. S. Brach Mfg. Co. required small, precision-made tubing for automobile antennas.

Specifications included:

- Finish free from die marks and other imperfections to allow good chrome plating.
- Lengths to be perfectly straight.
- True concentricity for telescopic operation.

SOLUTION: Precision engineers developed an alloy tubing that would not only meet these requirements but also provide maximum tensile strength and hardness. During production, quality control by skilled laboratory technicians continually checking the material in process made possible a finish, straightness, and concentricity that met Brach's specifications within extremely close tolerances.

RESULT: All tubing surfaces were exceptionally smooth and easily took a lustrous chrome finish. Final antennas operated without fault and provided an attractive appearance in keeping with the automobile's luxurious style.

If you have a problem that can be solved by the use of small, non-ferrous tubing, $\frac{1}{2}$ " O.D. to 0.010" O.D., contact Precision for Nth degree accuracy in size, shape, alloy, and finish.

PRECISION TUBE CO.

3824-26 TERRACE STREET • PHILADELPHIA 28, PA.

European Letter . . .

• Tito, with success in economic field, can control political position . . . Amicable relations and maintenance of western trade will aid in keeping support of people and his Communists.



LONDON—"Reaction in the west hates us; we are not loved in the east. Can we go on in this way? Of course we can because we must, because at present there is no way out." This is Tito's own summing up of the present grim position in Yugoslavia. Everyone else is asking today whether Tito can find a way out. He is trying desperately. His personal position, his life and fundamental political issues depend on the answer, and the strain of the effort is felt in every aspect of life in Yugoslavia today. The solution he is attempting is the rapid simultaneous development of industrialization and socialism. By industrialization he hopes to make Yugoslavia rich and powerful; by socialization he hopes both to keep the support of his own Communist Party and to show the Cominform and Moscow that they were wrong in saying that he was not a good Marxist; by the successful accomplishment of both he hopes to force Moscow to change its policy. He cannot achieve industrialization without some help from the west; yet he cannot be an orthodox Marxist if he leans too heavily on the west—that is Tito's dilemma.

Meanwhile, the difficulties of his position are immense. At the

moment it is clear that the Cominform hopes to achieve its ends by undermining Tito's position from within, not by attack from outside. Yugoslavia's neighbors are not massing troops on its frontier. It is clear that if they did attack, the Yugoslavs would rally to Tito and fight. There is no evidence to be found in Yugoslavia today that the army is not behind Tito. It is about 230,000 strong, has some heavy armament and a lot of hybrid modern light equipment, and is obviously stronger as yet than the combined armies of the immediate neighbors. The visitor to all parts of the frontier areas today sees the army much in evidence, but there is nothing to indicate that the Yugoslavs expect to have to use it in the near future.

The state organization against attack from within, always efficient in postwar Yugoslavia, has been tightened and perfected in the past year. Rankovic's organization of militia, secret police and security troops is by now a very highly trained body of men. Cases that have been reported in the newspapers of trials of Cominform agents in Slovenia, Croatia, Serbia and Montenegro show the careful watch that is being kept. The many widely related stories of people arrested, cross-examined about their political connections and then released, show how wide the net is cast. A check is kept on the political activities of all visitors and citizens. In these circumstances it is not surprising that there is nothing to show that any opposition has succeeded in organizing itself. Fanatical pro-Moscow Marxists inside the Communist party are still the

Reprinted from the London Economist by special permission.—Ed.

most likely source of opposition and vigilance in the party is intense. It is admitted that there have been purges, that party membership has been reviewed in detail and new membership cards reissued (reported from time to time in the newspapers). If Cominform supporters have evaded this comb-out they must be lying very low. They have before them the example of the ex-Ministers Hebrang and Zu-

jovic who are still in jail without trial. The eight members of the Politburo seem to be solidly pro-Tito; Pijade, the most outstanding old-time Communist who was not denounced by the Cominform, has come forward as the government spokesman in the bitter controversies that are being continually waged in the press against Moscow and the other Cominform countries.

AT one time it was expected that Tito might be attacked through the regional republics. It does not seem likely at the moment. Macedonia and Montenegro were regarded as the weakest links in the chain, but Tito seems to have strong control in both these areas. There is a long tradition of independence in Montenegro; it is a poor area, whose people are the first to suffer in times of economic difficulty like the present, when food and transport are short and distribution is inefficient. There have indeed been defections in Montenegro, the most recent of which were the president of the supreme court, Jovanovic, and a communist called Lekic who got away to Albania. But the chief leaders in Montenegro are so far firm and special attention is being paid there both to security and to supply.

In Macedonia great strides are being made in the development of local industries and of agriculture; this, together with a big housing program, has brought material improvements to the lives of many poor people. They are not likely to oppose Tito. But there is an old tradition of opposition to Kolisevski, the president of Vardar Macedonia; as late as 1943 and 1944 there was a strong pro-Bulgarian faction supporting Metodje Shatarov (Sharlo) against Tito in Vardar Macedonia. Although Sharlo is said to have been killed during the war, it is possible that the Bulgarian idea of an independent Macedonia, equal with Yugoslavia and Bulgaria inside a South Slav federation, would appeal to his followers, since that is nearer to their former policy than the situation of the present republic inside Yugoslavia. Kolisevski recently admitted that "ten or so" people in



TYPE "A"
ASSEMBLY BIT

COMMON
SCREWDRIVER

CLUTCH HEAD SUBMITS *Cold Facts* *in the Cold War On Costs*

- ☆ When users credit change-over to CLUTCH HEAD (from other types of recessed head screws) with 15% to 50% production increases . . . that cold fact merits investigation.
- ☆ When a leading refrigerator manufacturer says CLUTCH HEAD *eliminated cabinet damage* . . . that is high tribute to the safety and savings of non-tapered driving.
- ☆ When others testify that absence of "ride-out" (as set up by tapered driving) reduces the skid hazard "to zero," and also disposes of a fatigue factor . . . that emphasizes a two-way advantage from this exclusive CLUTCH HEAD feature.
- ☆ When the world's largest automobile plant tallies 214,000 screws driven non-stop on a high-torque application . . . that is a record in bit durability and smooth operation.
- ☆ When you consider that CLUTCH HEAD's Type "A" Bit can be repeatedly reconditioned on the spot in 60 seconds . . . that is reducing tool maintenance cost to a minimum.
- ☆ When only CLUTCH HEAD provides the Lock-On feature (which unites screw and bit as a unit) for easy one-handed reaching . . . that eliminates "fumble spots" and bottlenecks on the line for faster, smoother operation.
- ☆ With a recess basically designed for common screwdriver operation, CLUTCH HEAD removes field service "headaches" by simplifying adjustments . . . any time, anywhere.

Send for NEW BROCHURE illustrating and detailing CLUTCH HEAD's exclusive advantages for safer . . . faster . . . smoother, and lower-cost screw application. Mention sizes and types of screws that interest you.

UNITED SCREW AND BOLT CORPORATION

CLEVELAND 2

CHICAGO 8

NEW YORK 7

Macedonia had gone over to the Cominform, and it is known that ten trades unionists were arrested in February. But there are, at the moment, no signs of wholesale dissatisfaction or opposition in Yugoslav Macedonia. In Slovenia and Croatia, the Catholic republics of the north, Tito has gained support. It does not mean that Catholics or peasants like his policy, but many of them prefer the rule of an independent Tito to rulers who take their orders from Moscow. Throughout the country Tito has gained support from non-Communists for this reason.

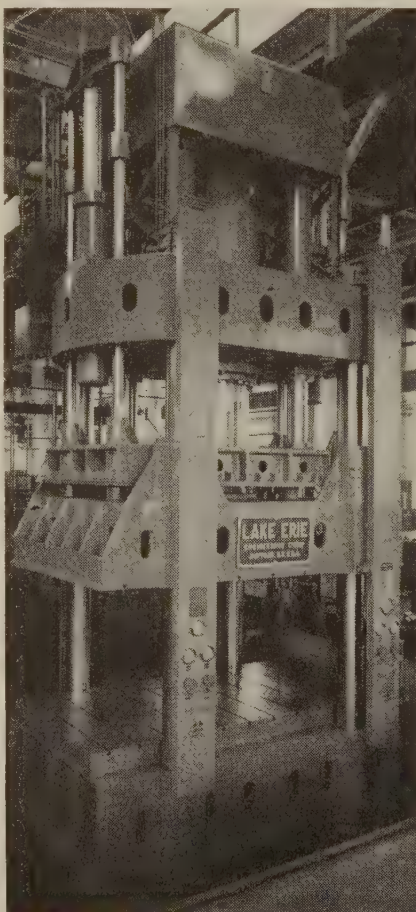
It seems, therefore, that Tito can control the political position providing he has success in the economic field. Yugoslavia's industrial potential is great, but development this year is almost certainly not as far advanced as was envisaged in the Five-Year Plan; and this is due in part to the fact that plant and capital equipment originally planned to come from the USSR and other Cominform countries have not been received. The basic question at the moment is whether this essential equipment can be imported from the west in time. In Belgrade, in recent weeks, there have been negotiations with American business men, with British and French trade delegations, and with representatives of other western countries. The west can supply the goods if Yugoslavia can pay for them. Yugoslav metals, minerals, timber and food are all valuable exports, but large quantities of all of them are needed to pay for expensive capital equipment; and one of Tito's major difficulties is to see that Yugoslavia is not committed to deliveries beyond the productive capacity of the Yugoslav workers. This is already a danger both in the matter of copper and of food.

THE government's insistence on the importance of production is seen in every aspect of life in the country. Miners and heavy workers receive three times as much flour, five times as much meat, three times as much sugar and two and a half times as much fats as ordinary producers. There are still complaints about absenteeism of workers who go home to their peasant families to help get more food. There are also complaints about inefficiency and slow-

ness in mines and factories. The trouble is that most of the industrial workers are raw peasants who know nothing about machines, and this is a difficulty which only time and experience can remedy. With this lack of machinery, inexperienced workers, shortage of food, housing and consumer goods the problems of production are enormous. Tito has one advantage to outweigh these difficulties: the Yugoslav workers are among the hardest working people in the world. If they get enough food they may yet help Yugoslavia to pull through.

The problem of providing food for home consumption and export is of fundamental importance. For all the last year the food situation for all Yugoslavs, except the peasants, has been very difficult. If Tito is to get continued hard working support from the townspeople, there will have to be improved food

BOUND FOR ITALY: *This 1000-ton double-action 750-ton pressure hydraulic press, occupying 3 railroad cars, has been shipped to one of Italy's producers of metal stampings for automotive equipment. It was built by Lake Erie Engineering Corp., Buffalo.*



supplies. That is the explanation of Tito's and Kidric's repeated assurances that fats and wheat would not be exported this year. Plans are already being put into effect to meet the need. Work has been started on drainage operations to release new land for cultivation in the Skadar Lake and Lonja Plain areas. Great works of irrigation have been undertaken in the Vojvodina in Macedonia and other parts of the country. The drive for the increase in the numbers of co-operative farms also aims to step up production by increasing the size of agricultural units. It also gives the government more control over food collection. There were 910 cooperative farms in Yugoslavia at the time of the Cominform denunciation a year ago; there are now 3710. But this still leaves the greater part of food production in the hands of individual peasants.

FOOD collection in the past year has not been entirely satisfactory, particularly as regards meat and fats. It was officially stated that 84 pct of the meat quota had been collected, and it is admitted that a lot of slaughter of young animals goes on. This year the quotas of cereals required from peasants have been raised enormously, leaving very much less for disposal on the free market. It remains to be seen whether these measures will be effective. Agriculture is the only branch of the Yugoslav economy which has not yet been drastically socialized. Industry, commerce, both wholesale and retail, and every other significant aspect of the country's economy have now been nationalized and Tito can reasonably claim that the socialization of agriculture is as far advanced (if not further) in Yugoslavia than in any Cominform country except Russia.

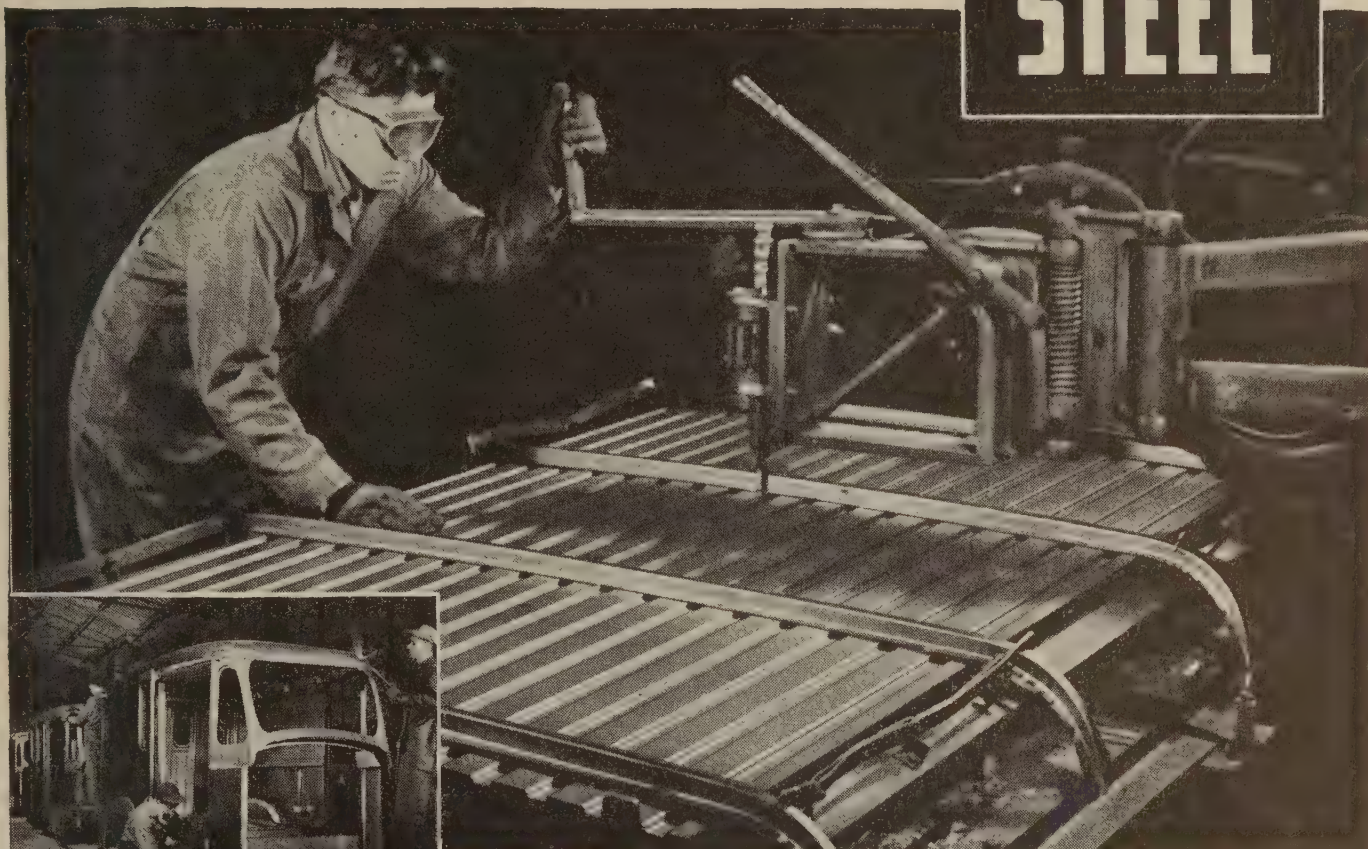
It will be at least two years before Yugoslavia can reap the benefits of these changes, both in industry and agriculture. The problem for Tito is to keep the hardworking support of the general body of the people during that time. He must have trade with the west, and has to arrange it in such a way and on such terms as to keep the support of his own ardent Communists. He cannot succeed without a large measure of luck. A bad harvest this year might turn the scales against him.

Hughes-Keenan Corporation

Increases Truck Payloads 20%

with J&L OTISCOLOY high-strength steel

J&L STEEL



(Above) Spot-welding a truck roof-reinforcement and bow assembly, made of J&L OtiscoLOY steel, at the Hughes-Keenan Corporation, Delaware, Ohio. Both the panel and bows are cold formed.
(Left) Truck bodies on the Hughes-Keenan assembly line.

Builds stronger, longer-lasting truck bodies with less steel

Eliminating 20% of the deadweight from milk truck bodies is not the only advantage in using J&L OtiscoLOY high-strength steel, according to Hughes-Keenan Corporation, Delaware, Ohio.

For good sanitation, milk truck bodies must have their interiors steam-cleaned every day. Moisture from melting ice refrigeration during milk delivery is always present. Normally the continuous wetting and drying would cause rapid corrosion in a milk truck body made of mild steel.

OtiscoLOY resists rust four to six times

as effectively as mild steel. This pays off to the truck owner in longer service life. And it pays off to Hughes-Keenan Corporation in having a better quality, lighter, longer-lasting truck body.

The quality in these truck bodies does not entail added production costs. Although high-strength steel is more expensive than mild steel, OtiscoLOY is used two gauges lighter with equal or greater strength than ordinary mild steel. Four sections can be made from OtiscoLOY where only three sections of equivalent strength could be made from the same weight of mild steel. More units are produced per ton, freight costs are re-

duced, units are lighter, easier to handle during production.

OtiscoLOY is recommended for applications where strength without bulky weight is desired—also where corrosion, abrasion and fatigue are problems in the service life of equipment.

OtiscoLOY can be formed hot or cold, welded, forged, flame-cut and otherwise worked by standard methods. Here is a modern steel that is worth your investigation. Why not return the coupon to us today?

Jones & Laughlin Steel Corporation
403 Jones & Laughlin Building
Pittsburgh 19, Pa.

Please send me at once a copy of your booklet, "OtiscoLOY High-Tensile Steel."

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY and JALLOY (hi-tensile steels).

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

June 7, 1949

• **BANKED**—Republic Steel Corp. early this week banked its No. 3 blast furnace in Cleveland. This is the second merchant stack to be taken out of production of five blast furnaces which Republic operates in the Cleveland district. A Republic spokesman said the banking of No. 3 is the result of present scrap prices, which are so low that consumers are using scrap instead of merchant iron. Production of this furnace is not needed for steelmaking. This reduction, in addition to the removal of No. 5 furnace from production, represents a 25 pct cut in Republic's pig iron making operations in the Cleveland district.

• **MILL SUSPENSIONS**—Sharon Steel Corp. closed its Lowellville, Ohio, works this Monday to install new blooming mill equipment and a new soaking-pit crane. The suspension, which may last 2 weeks, is not part of the vacation program. Pittsburgh Steel Co. banked the only blast furnace it has been operating, as well as 10 of its 12 openhearths at its Monessen, Pa., works, to install a new hot metal crane. The finishing mills are still running and two openhearths are working to supply the Allenport Tube Mills. The crane installation is expected to take a week or 10 days.

• **SPREADS OUTPUT**—Republic Steel Corp. is resuming production of merchant iron at Troy, New York. Grades will be priced as follows: Basic \$48; foundry \$48.50; malleable \$49 and low phos \$54. Republic has been producing only low phos at Troy. Decline in demand for low phos prompted the return to production of other grades which Republic made at Troy several years ago.

• **PARADOX**—While most large scrap consumers' inventories are still known to be large, some smaller consumers have hit rock bottom on their scrap piles. Some have trimmed their inventories so low they have found it necessary to offer 50¢ premiums for immediate delivery.

• **PLATE REDUCTION**—Worth Steel Co. has reduced its carbon steel plate price by \$6.00 a ton effective June 1, making the base price 3.50¢ per lb, Claymont. Steel for flange shop products has been reduced to 3.45¢ per lb. Claymont.

• **LOWERS PLATE PRICE**—Bethlehem Steel Co. reduced plate prices by \$1.00 a ton on June 6, bringing its quotation down to \$3.40 per 100 lb, the price prevailing in major market areas.

• **ANOTHER CHECK**—Scrap dealers collecting from plants have a close check on production. Some of them swear their collections have dropped 50 to 70 pct from what they were last December. With mass vacations starting in July, production in many consumer shops will drop drastically. This is one reason mills have had trouble booking July and August business, particularly tonnages for small plants. These plants, working on slim inventory, prefer to wait until after vacation period to place steel orders for third and fourth quarter delivery. They now know that if they decide on Aug. 1 to buy some steel they can get it into their plants before the month is over.

• **FIRST HELPERS STRIKE**—Second week of a wild-cat strike of 27 openhearth first helpers has idled 1400 at Crucible Steel's Midland Works. Previous to the walkout 1000 had been laid off due to declining orders, bringing the total idle to 2400. To trim costs Crucible, on May 29, replaced first helpers with supervisory men who had come up through the ranks. The company says the contract allows this but the first helpers balked.

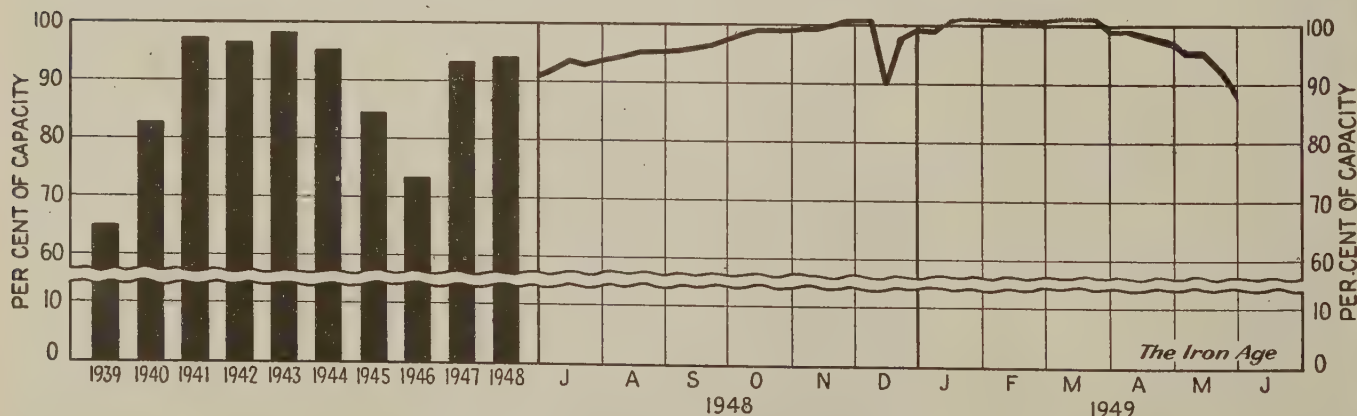
• **PROTEST**—Some auto dealers have been unable to move heavy shipments of cars and trucks which they have been receiving. In the case of heavy trucks, dealers this week openly protested delivery of more than they could sell. Although this is the first time this has happened since the war, it may be repeated in the months ahead.

• **NEW PRICES**—New f.o.b. mill prices have been established in Detroit on the following items: Carbon forging ingots \$50.00, alloy ingots \$51.00, carbon forging billets \$61.00 and alloy forging billets \$63.00. These prices are the same as those charged in other major steel producing centers. Detroit prices are usually \$4 per ton higher.

• **FURNACE OFF**—Carnegie-Illinois Steel Corp. took off No. 6 blast furnace at its Duquesne (Pa.) Works on June 6, blaming declining business. This still leaves U. S. Steel in the abnormal position of having 35 out of its 36 Pittsburgh-Youngstown district furnaces in blast.

• **UP AND DOWN**—At Buffalo Republic Steel Corp. added two openhearths, others remained unchanged. Bethlehem shutdown a blast furnace, rated at 850 tons, for relining which leaves 5 blast furnaces still in operation at Lackawanna.

Steel Ingot Production by Districts and Per Cent of Capacity



* Revised.

Industrial News Summary

- **No Steel Price Cuts Seen Soon**
- **Ingot Rate Will Determine When**
- **New Business Still Sliding Off**

STEEL consumers are price conscious. They will stay that way for some time. And they will put pressure anywhere they can to get their steel costs down. But there is little chance that they can depress the base prices of steel in the immediate future.

Steel users tasted blood earlier this year on steel costs when: (1) Gray market prices disappeared completely, (2) conversion deals faded away overnight in the majority of cases and (3) premium steel prices, slightly more than regular mill prices, went out the window when demand started to slip.

Steel users have in many cases passed on those savings in the form of lower prices to their customers. Now they are probing to see where they can cut costs more when competition gets really rough.

Nothing will be done on steel prices until steel firms know what their coal bill will be for the next year. And what it will cost—if anything—when the steel contract negotiations are closed. But the price situation in steel is far more complex than just waiting for the coal and steel labor settlements.

The day of widespread bargain basement sales in the steel industry may not return for some time. Yet there may be some rugged price cutting in the steel industry if the ingot rate gets so low that many mills are extra hungry for business. This happened before and it probably will happen again. But with (1) wage rates higher than prewar, (2) a strong union in steel, (3) other costs still at top levels and (4) only scrap having been reduced in recent months, there will be a lot of heavy thinking before any steel unit steps out and tries to gobble a lot of business at a cut-rate price.

THE advantage of grabbing enough steel orders to keep a mill going for several months at a cut-rate price also has its drawbacks. For one thing, within a few hours the cut price is known and met throughout the trade. And if another cut comes it will be met, and maybe shaved. There is a limit—as there was in 1938—to how low the base prices of steel can sag. It has always been a very low operating rate which has touched off the bargain sales. The real test of today's prices will not come until the operating rate goes well below what it is this week.

The O'Mahoney bill to allow freight absorption by the steel industry can't come too fast for some steel areas. The House still has to agree on the Senate version. Even if the bill is finally passed so that freight can be absorbed by steel firms it should be remembered that (1) the steel com-

panies are still under an FTC cloud, the steel case not yet having been completed by the commission; (2) freight rates are so high that in some cases freight absorption is academic and (3) business is slipping so fast in some locations that backyard concentration is the rule.

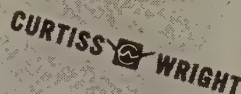
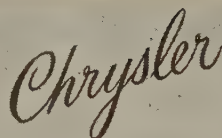
Because of the f.o.b. mill system, the Pittsburgh area has been operating at a lower rate than Chicago. At Chicago the rate this week is 97.5 pct compared with the Pittsburgh district rate of 84.5 pct. Part of the decline at Pittsburgh was due to a strike and furnace repairs. Even if this were eliminated as a factor, there would already be a difference of 9 points between Pittsburgh's ingot rate and Chicago's. A month ago there was only a difference of a point or two. This spread may become greater as business falls off. If mills absorb freight later, when allowed by law, the difference may be reduced some but not completely.

THE national steel ingot rate this week is 89 pct of capacity. This is off 3 points from last week's revised rate of 92 pct. A small part of this decline was due to a strike and to some furnace repairs. But the greater part was due to a falling off in orders and backlogs. Since the high this year the ingot rate has dropped 13½ points or 13 pct.

The steel market outlook does not augur well for any big coal or steel labor contract concessions. If anything, it puts a damper on negotiations which are to start soon. But the downward trend in steel business will not be overplayed by management to bring about sterile wage negotiations.

There is still a good chance that there will be no strike in coal or that if there is one it will be shortlived. Nor is there now any reason to expect a long impasse on the steel contract negotiations which start at Pittsburgh next week. Rough trading and bargaining, yes. But probably an amicable agreement without too much name calling. The union demand for a health and insurance program with its 8.4¢ an hr cost would mean—if granted—an added cost to finished steel of \$1.65 a ton. But if extended to industries other than steel, it could snowball to a total added cost of \$3.30 a ton.

The scrap market is still in the doldrums this week. It probably will stay there for awhile. Although no major changes in prices occurred, at Pittsburgh No. 1 heavy melting steel is off an average of 25¢ a ton. This has taken THE IRON AGE steel scrap composite down 8¢ a ton to a new low of \$21.67 a gross ton, off \$21.33 a gross ton since the first of the year.



THIS

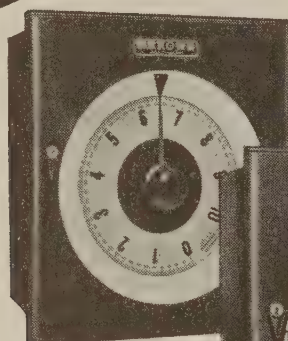
Acceptance

MEANS MORE THAN WORDS

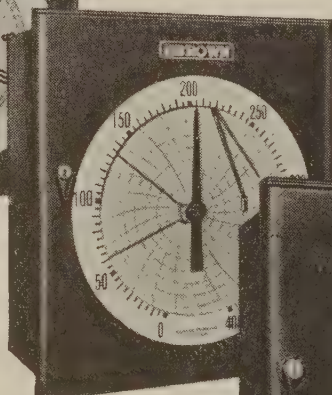
... In the Success Story of the

Electronik

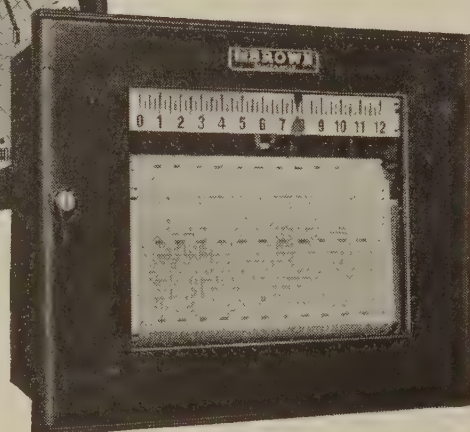
POTENTIOMETER



Circular Scale



Circular Chart



Strip Chart

Continued acceptance by industry leaders like these vouches for the quality of the *Electronik* Potentiometer . . . the instrument that is built to set the standard of performance!

MINNEAPOLIS-HONEYWELL REGULATOR CO.

BROWN INSTRUMENTS DIVISION

4483 Wayne Avenue, Philadelphia 44, Pa.

Offices in principal cities of the United States,
Canada and throughout the world

Here are the reasons why the Brown *Electronik* Potentiometer is the leader, and has been the leader since its introduction in 1941

- QUALITY** finest components, engineered and assembled by master craftsmen.
- PROVED PERFORMANCE** eight years of outstanding, low-cost performance to industry.
- SENSIBLY PRICED** made possible by consistent volume production.
- UP-TO-DATE** through continuing research and development.
- FUNCTION-FITTED** available in the three styles shown with a choice of speeds and a variety of control forms, electric or pneumatic.
- ACCEPTANCE** ordered and reordered by industry's leaders.

MINNEAPOLIS
Honeywell

Advanced Instrumentation
FOR METAL PROCESSING

BROWN
INSTRUMENTS

Reject Sheets Hit By Consumer Selectivity and Inventory Reduction

Cleveland

••• Reject sheets were leading the steel inventory liquidation derby this week as consumer buying in the flat-rolled steel market reached a peak in postwar selectivity.

These related and parallel developments broke into the clear about a month ago when rumors of diminishing demand for steel were found suddenly to have substance.

Latest byproduct of the buyer's market in steel, the reject sheet surplus will be more of a market factor for the next 6 months than its prewar past would indicate, for the following reasons:

Demand for rejects, excess primes, primes No. 2 and primes No. 3, etc., is off from 15 to 50 pct.

Price-wise the market is confused and not without an element of panic. Reject prices, according to one source, are going screwy. Some distributors are selling for whatever they can get and the spread runs from less than mill cost where the seller is over-stocked, to the steel warehouse price on primes. Needless to say, this last represents a happy extreme to the seller.

Some segments of the regular reject sheet market have dried up completely for the time being, either for liquidation of their own reject stocks, or lack of orders, or both. Also, manufacturers normally users of primes with excess stocks are also liquidating tonnage which is accelerating the movement.

Few manufacturers are interested in buying even at low prices. Big cash discounts off regular reject prices are being used as an inducement, with little success in most industrial sectors.

At present there is plenty of inventory which will take, probably, from 90 days to 6 months to liquidate, at the present rate of consumption. The market is flooded.

Distressing as the reject surplus may presently be, price-wise, to secondary sellers and mills to some extent, its recent background suggests that some of this ma-

Consumer Selectivity Causes Smaller Ingot Yield And Rising Unit Costs

• • •

By BILL LLOYD
Cleveland Regional Editor

• • •

terial may never move again at more than scrap prices.

Normally, about 5 pct of flat-rolled steel production gets into the reject market, although some mill sources estimate the total closer to 6 to 7 pct. But during the past 3 years a lot of tonnage has been shipped that never would

have reached mills' freight docks prewar, and there is tonnage still moving today that would have been rejects during the 1930s.

Bad edges, flaws in rolling and gage, and surface imperfections, etc., showed up at mills' inspection benches during this period, but when the customer was told his order would be short a certain number of tons due to these defects, he usually insisted that this tonnage be shipped with the primes despite the defects. And generally, in such cases, the defective material was billed as primes.

However, as recently as last month, big users of conversion tonnage, some of whom were still cleaning up their commitments

Quality Conscience



with converters, were making their converters take the rejects.

Secondary sellers, particularly, took plenty of tonnage during the postwar period that should never have left any mills, including some that was actually scrap. Thus, the quality spread works against price stability in the reject market.

On the other hand, sales of flat-rolled rejects, particularly sheets, have been a very profitable business for the past 20 years, and veterans of the business say the future is not as dim as it appears at the moment.

What secondary sellers handling rejects would like to see mills adopt is a policy of selling reject material to only established jobbers throughout the country. This would make for price stability, something which never has been an accomplished fact in the reject market, according to veterans of the business.

But mills, for a variety of reasons, are not likely to do this, and as long as mills sell to anybody with money, trade sources point out, the reject market will never be stabilized.

Improved methods of production and inspection would appear to potentially reduce the reject market, but this has not been the case thus far in the postwar period. Rejects are running as high as ever.

From the mill angle, customer

selectivity is a more serious problem than the reject surplus.

For the record, customer selectivity has been growing for the past 6 months, but has developed very strongly during the past month and evidence of it is freely at hand. Quality requirements are now little different from prewar.

Refusals to take sizes that won't fit the job are increasing and consumers are refusing to shear where they recently were willing. Claims are going up. Rejections at the mill are increasing. Consumers rate mills on performance, flatness, finish, drawing quality, etc., and every phase of quality means more rejections by mills.

Traditionally, the steel industry has plenty of arguments with automobile companies over quality. At present, mills can give the auto companies the quality they want but not always in the quantity desired. And bearish factors to the contrary, most auto companies prefer the advantage of tonnage.

According to one mill source, consumers generally have reached a point where "if you don't have a fly swatter to keep every minor mark off the product, you're in for complaints or claims."

But the new selectivity of consumers also poses a problem for mill personnel, many of whom were not in mills when quality was a factor. The trick is, of course,

to hold the seconds and rejects down with personnel who in many cases weren't in the business when it was competitive.

Meanwhile, sheet consumers are demanding good surface, uniformity of gage and drawing properties in sheets. Bar consumers want good uniformity to size and good forging quality. Galvanized sheet consumers want a tight coat, soft temper, and freedom from "salty" spots. Users of special steels will continue to be very selective.

Such consumer requirements for these and other finished steel products could conceivably force rejections at the mill up as much as 3 pct for a period of 6 months or longer.

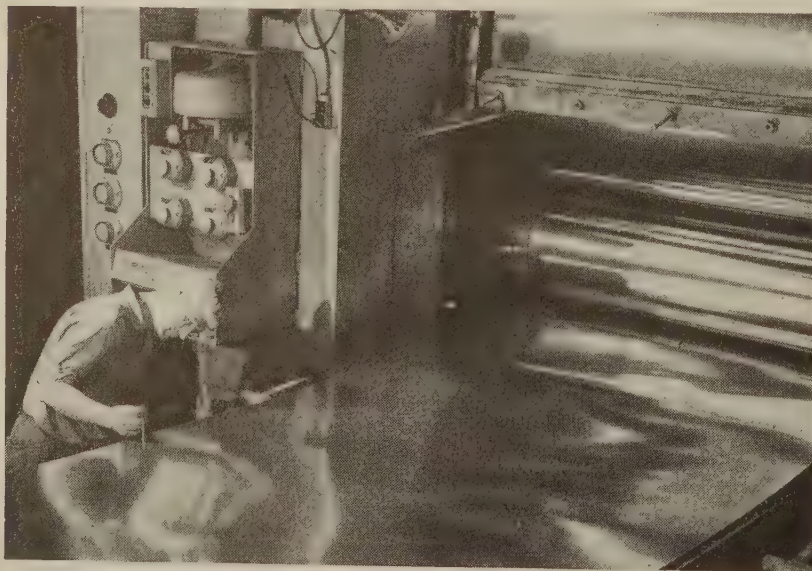
A possible net effect of the new consumer selectivity would be a reduced yield for mills, which would increase costs. Or to put it another way, a mill shipping 75 pct of an ingot in finished cold-rolled products will be doing very well.

Thus, the operating departments of mills want, and will want to a large extent, rejects sold to keep the costs down.

But the sales departments, even with the price of scrap at its present low level, would rather scrap some of the rejects than knock the reject market for a loop, this could have possible repercussions in the prime market, which is very firm price-wise at the moment. And it is likely that sales departments, in general, will have their way.

To put it rudely, a reject is going to be a reject from now on and the day of shipping everything that will sink in water is rather definitely over.

QUALITY: With the return of the buyers' market, consumer selectivity has increased. This places accent on quality. Inspections such as this at Republic's Massillon stainless finishing plant are slated for an increasingly important role in the race for markets.



Investigates Metal Imports

New York

• • • **W. F. Brazeau**, president Int-sel Metals Corp., recently formed subsidiary of International Selling Corp., has left on a 2-month trip to Europe and Africa. He will investigate the development of metal and mineral materials for import to the United States.

Mr. Brazeau also plans to make a survey of present trends in the European nonferrous metal industry, including the relationship between business conditions in Europe and the U. S.

Canadian Exports Up Over '48 Period With U.S. Buying One Half

Ottawa

••• For the month of April Canada exported goods to the total value of \$237,800,000 which compares with \$216,800,000 in the month immediately preceding and \$212,300,000 for April, 1948. For the month under review the United States bought goods to the value of \$110,654,000 compared with \$109,219,000 in April last year, or almost half of our total exports. The United Kingdom was Canada's second best customer, purchasing goods to the value of \$63,049,000 in April this year against \$44,353,000 in April, 1948.

In the first 4 months this year Canada exported goods to the value of \$896,600,000 which compares with \$884,400,000 a year ago. Of the 4 month's total, shipments to the United States amounted to \$455,804,000 up from \$421,553,000 for the like period of 1948, while in the period under review the United Kingdom took goods to the value of \$202,484,000 compared with \$220,143,000 in the first 4 months of 1948.

For iron and steel products and base metals, exports for April this year are as follows with those for April, 1948 in brackets: Farm implements and machinery, \$11,538,000, (\$6,928,000); machinery, except farm, \$3,077,000, (\$2,966,000); copper and products, \$7,691,000, (\$4,267,000); lead and products, \$4,567,000, (\$2,311,000); zinc and products, \$5,201,000, (\$3,394,000); nickel, \$10,010,000, (\$6,193,000); ships and vessels, \$7,122,000, (\$1,642,000); aluminum and products, \$6,887,000, (\$6,970,000).

New Broaching Division

Detroit

••• Establishment of a completely equipped production broaching division has been revealed by Colonial Broach Co., Detroit. The new division will help manufacturers whose broaching requirements don't warrant purchase of broaching machines. It will also assist manufacturers in experimental production work.

The department is equipped with several Universal horizontal broaching machines, as well as a

group of vertical press-type machines of various capacities, which are adaptable to either internal or surface broaching. The department is also provided with a number of round keyway and spline stock broaches in several standard sizes.

Norwegians Visit U.S., Canadian Mining Projects

Washington

••• Arne Stavang of the Sydvaranger Iron Mines, Norway, will visit the International Nickel and Algoma mining properties in Canada, Minnesota State Mines Experimental Station and the Oliver Iron Co. laboratory at Duluth during the first half of June in a study of American methods of sintering.

During the same period, another Sydvaranger official, Arne Hofseth, will visit mining projects in Ontario, the Mesabi range, and also the International Nickel mines in a study of open pit methods.

Cuts Refrigerator Prices

Detroit

••• Norge division of Borg-Warner Corp. has decreased the price of its domestic refrigerator models from \$10 to \$40.

Most drastic price cut is in the super deluxe 8 ft model which has been reduced from \$340 to \$299.95.

ECA Approves Funds For British Iron And Steel Plant Equipment

Washington

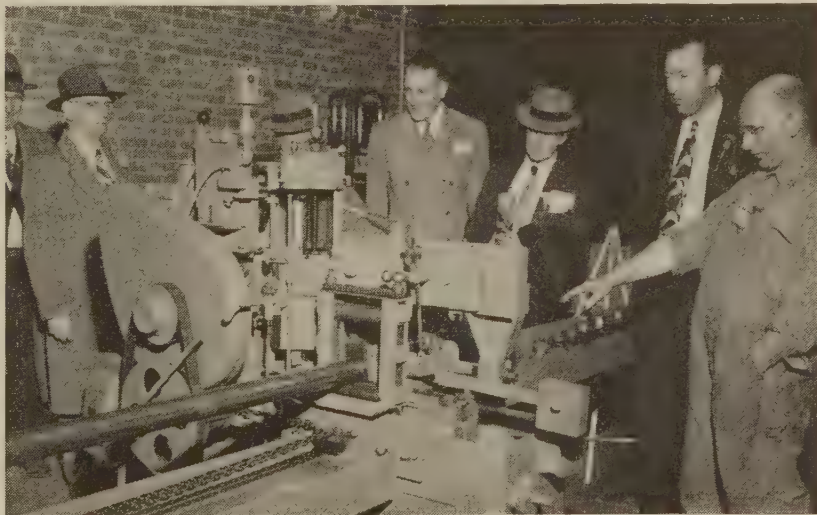
••• The Economic Cooperation Administration has authorized the expenditure of \$2,730,000 of ECA funds necessary for certain additions to steel plant equipment and for equipment for iron ore production for Stewart & Lloyds Co., Ltd.

Stewart & Lloyds are the largest producers of steel tube in the United Kingdom, with a main plant at Corby, Northamptonshire. The firm has eight subsidiary plants in Scotland, four in the Midlands, and two in South Wales.

The ECA Projects Committee said the authorization was a small but vital part of a long-range modernization and expansion program planned by Stewart & Lloyds which will involve the equivalent of \$63,000,000. All of the \$2,730,000 ECA aid approved will be spent in the United States.

Requirements from the U. S. for the company's overall program include an electric weld tube making plant for Corby, a walking dragline for ore production at Corby; tube threading machines for Corby, Clydesdale and Tolcross, and boring and tapping machines for Tolcross.

EXPANSION PROGRAM: Visitors watch machine operation while touring the recently enlarged and modernized steel service plant of Joseph T. Ryerson & Son, Inc. in Philadelphia. The tour of the plant afforded visitors an opportunity to see how a modern-service plant operates. Various operations incidental to supplying steel from stock were demonstrated including sawing and shearing steel, and flame cutting steel to shape with automatic torch burning machines.



Industrial Briefs . . .

• **EVERYBODY WELCOME**—For the first time in its history the Timken Roller Bearing Co. will open its doors to the entire public at all its plants on June 20 to 24 in celebration of its fiftieth anniversary.

• **STARTING OUT**—Announcement has been made of the formation of Barker, Smith & Co., specializing as engineers of equipment, machinery and supplies for heavy industry, with offices at 60 E. 42nd St., New York. Alexander C. Barker, formerly vice-president and director of H. A. Brassert & Co., New York, is president.

• **UPS CAPACITY**—A one third increase in capacity will result from the expansion of Reynolds Metals Co. wire, rod and bar mill at Listerhill, Ala. The enlarged mill will soon be in full operation and will include certain equipment transferred from their Plant 7 in Louisville.

• **CHCl₃:CCl₄ PLANT**—Hooker-Detrex Inc., Niagara Falls, N. Y., has announced that they are going to build a new plant for the manufacture of trichlorethylene, a metal cleaning and oil-extraction solvent, in Ashtabula, Ohio, at a cost in excess of \$1½ million.

• **SPREADING EAST**—A factory branch sales office in New York at 347 Madison Ave. and a service station and parts depot at 1749 York Ave. for its entire Eastern territory have been established by the Automatic Transportation Co., Chicago, electric industrial truck manufacturer. Philip E. Whiting has been named Eastern district manager.

• **ABSORBS HEATERS**—Palmer Mfg. Corp., Phoenix, Ariz., has announced the purchase of the Pacific & Superior Heating Divs. of the Naco Mfg. Corp., Los Angeles. Palmer will manufacture the Pacific and Superior heating equipment from the same dies, patterns and tooling developed by Naco.

• **MORE ROOM**—K. Wm. Ostrom & Co., resistance welding service, has announced the removal of their offices to 3717 Filbert St., Philadelphia.

• **IN FULL SWING**—Chromium Mining & Smelting Corp., Sault Ste. Marie, Ont., expects to have all of its eight reduction furnaces in operation by the middle of this year, producing not only standard products, but branching into new fields. At present production is being centered on exothermic chrome and silicon and standard silicon products.

• **WIRE FOR INDIA**—Paulsen-Webber Cordage Corp., New York, has announced the signing of the fifth in a series of contracts between his organization and the government of India for galvanized guy strand. The new contract for 600 miles of wire is being fabricated at the plant of the Sunbury Wire Rope Mfg. Co., Sunbury, Pa.

• **ADDS TAPPERS**—Automatic Steel Products, Inc., Canton, Ohio, has announced the acquisition of the Cleveland Tapping Machine Co., Hartville, Ohio. The company plans to expand its development and production of automatic multiple tapping machines. W. R. Harrison remains as president and general manager of the Cleveland company.

• **TOOL SALES**—Merrill Bros., Maspeth, N. Y., manufacturers of drop forgings and materials lifting devices, has announced the appointment of the George A. Allen Co., 9 S. Clinton St., Chicago, as sales representative for the states of Illinois, Missouri and Kansas.

• **AMPCO DEALER**—Ampco Metal, Inc., Milwaukee, has announced the appointment of Pye-Barker Welding Supply Co., 231 Pryor St., S.W., Atlanta, as distributor for their line of arc-welding electrodes.

Blaw-Knox Improvements Will Involve \$1.5 Million

Pittsburgh

• • • **Blaw-Knox Co.** will spend \$1.5 million in modernizing three of its foundry plants, it was revealed recently by William P. Witherow, president, in an announcement to employees. The plants are those of Lewis Foundry & Machine Div., Union Steel Castings Div. and Pittsburgh Rolls Div., all in the Pittsburgh area.

Plans call for improved and enlarged heat treating furnaces at the company's 62nd St. property to serve all three divisions. New and improved iron air furnaces and cupolas for the production of iron rolls will be installed in the Lawrenceville district and will serve both Lewis Foundry and Pittsburgh Rolls divisions. Included in the program are the purchase of some additional property as well as additional equipment at all three plants.

Mr. Witherow reported that "each division will maintain its own engineering and metallurgical departments and will have control over the manufacture of its own production, which will be sold and serviced by the same personnel and in the same manner as at present. The project is designed not only for more economical production but also for quicker delivery and for the maintenance of the present high quality of our iron and steel rolls. In addition, the program will permit Lewis Foundry & Machine Div. to increase its production of rolling mill and other special machinery and to produce more advantageously certain iron castings used by the company."

Expands Southwest Power

Washington

• • • **A southwest power expansion project** involving expenditures of more than \$50,000,000 for construction will be carried out over the next 3 years.

In a stock registration statement filed with the Securities & Exchange Commission, the Houston Lighting & Power Co. of Houston, estimated its construction costs at \$25,000,000 during 1949, \$16,800,000 in 1950, and \$14,200,000 in 1951.

Canada's International Fair Shows Need for World Commerce

World Event Seen Helping
Remove Picket Fences
Around Enterprises

By TOM CAMPBELL
News-Markets Editor

Toronto

• • • **Optimism** springs eternal. To believe this is to see it working. It was working at Canada's second International Trade Fair. Midst some of the most stringent restrictions on international trade, 35 countries were represented at the opening last week. What's more they were doing business.

But it was a buyers' market. There was more talk this year than last year. Those who are responsible for this big undertaking of the Canadian government hope that, if nothing else is served by the fair, it will help international trade relations.

Majority of firms showing at the fair were Canadian and Canadian subsidiaries of U. S. firms. But that did not overshadow the appearance of Eastern European countries, Western European standbys, China, India, South Africa, Portugal and many other countries. Those firms came to the fair at great expense to themselves and at great physical and mental obstacles.

U. S. Secretary of Commerce Sawyer was there officially to open Canada's big top. But unofficially, he was also looking into the workings to see if such a fair were feasible in the United States. It was known that the U. S. government would under no circumstances underwrite an international fair as does Canada.

Delegations from Detroit and Atlantic City were to size up the fair here and see what was needed and how things worked. They might try it, too. The public was allowed into the Canadian Fair only 2 days. Officials here feel that more business can be done if the event



ALL FOR ONE, ONE FOR ALL: They say this is the first time since 1776 that Canadian, British and American trade chiefs have met together. Here they are at Canada's Second International Trade Fair. Left to right they are: the Rt. Hon. C. D. Howe, Canadian Minister of Trade and Commerce; the Rt. Hon. Harold Wilson, president of the British Board of Trade and the U. S. Secretary of Commerce, Charles Sawyer.

is restricted only to buyers and sellers. By the time the fair closes on June 10, Glen Bannerman, director of the Canadian Government Exhibition Commission, hopes that 50,000 people will have had their fill of the various trade booths and exhibits.

The first two days showed more people were interested in light goods than in semidurable and durable goods. But then no one expected to fill their order books. Some smaller concerns expected to have the same luck they had last year—a good run for months based on their Canadian contacts. There were the usual number of people who traveled half way around the world to meet and sell each other in Canada—even though they were only a few miles apart in their own countries.

At the serious speech making sessions and at the 30th annual dinner of the Canadian Periodical Press Assn. there were sombre statements. It was something new for the Canadians to hear the chief trade man from Great Britain plead for their business and a clear

understanding of conditions in Britain. Yet that was the theme of Rt. Hon. J. Harold Wilson, president, board of trade, United Kingdom. It was one of the most frank and humble speeches heard by Canadians for a long time—judging from reactions recorded at the dinner of the press association.

Mr. Wilson's theme was simple. Britain's exports in 1948 were only controlled by her capacity to produce. But in 1949 they would be measured precisely to the extent that Great Britain can cut costs of production. And the Canadians, like their neighbors in the United States, are cost conscious. If the price isn't right they don't buy.

Right now Canadian manufacturers are quietly working down some high priced inventories. There is as yet no downturn in Canada to compare with the trend in the United States. But oldtimers wag their heads here. They know that what happens in the States happens—in part any way—in Canada about 4 to 6 months later.

It will be some time before Can-

ada works off the high priced steel which they bought from Great Britain. Commitments were made last year. They will be taken up. When that process is over, business will be at a lower level. With Canada having boosted its steel output 111 pct over 1935, it looks as if its steel industry will be taking care of a larger portion of home requirements. This means that both England and the U. S. can expect to kiss goodbye some of the large orders given by the Canadians.

But Canadians think the theme of the international fair, which Commerce Secretary Sawyer endorsed in four public appearances, was worth the effort. If it does nothing else, it is paving the way for the time when the world will not be filled with picket fences around enterprises.

Issues Motorists' Booklet

Detroit

• • • A new booklet for motorists, "How to Drive Safely and Economically," written by Cannon Ball Baker, veteran automobile road test driver, has been published by Nash Motors Div. of Nash-Kelvinator Corp.

The booklet features the theme "Safe driving is smart driving—and smart driving is economical in terms of cars and people."

Barter Plan Aimed at Dollar Shortage Places Emphasis on Goods, Not Dollars

New York

• • • Barter is the answer to the dollar shortage. That is the belief of Eigil LaFontaine, international



E. LaFontaine

president, World Assn. of Industry and Trade. Mr. LaFontaine expressed this opinion in an interview at the newly opened United States office of I. T. here.

Mr. LaFontaine described I. T. as a subscription membership organization with the aim of fostering international trade by developing close business relations between exporters, importers and manufacturers throughout the world. He said the organization is non-trading and non-political.

It all started in 1938 in Scandinavia, when Mr. LaFontaine, Danish newspaperman and exporter, sold his idea to a group of prominent industrialists and world traders. The idea clicked and the organization soon spread to other European countries and Latin America.

But its first life was short—interrupted by the war. At war's end it was flat on its back; had to be rebuilt. Today I. T. has offices in 33 principal industrial cities of the world, in 30 countries. Its trade information is circulated in 14 languages. I. T.'s plans for the U. S. are ambitious. In addition to New York, they include establishment of offices in Philadelphia, Boston, Chicago and Los Angeles.

At present I. T. provides its members with 15 services. Of these, two in particular are most intriguing. They are: (1) A bi-weekly publication of goods wanted and offered in various countries, and (2) a plan to by-pass currency restrictions or shortages through a system of barter.

I. T. has discovered currency problems (dollar shortages) loom as the most aggravating obstacles to commerce. Mr. LaFontaine says barter will take the emphasis off money and place it on commodities.

"For example," he said, "A British exporter may have a product to sell but can't find an immediate buyer. At the same time a British importer wants to buy goods here but doesn't have dollars. I. T. hopes to assist in finding the buyer for the exporter. The dollars thus obtained would be used to purchase the goods wanted by the importer. The exporter would receive payment in pounds from funds put up by the importer and no dollars would actually be transferred."

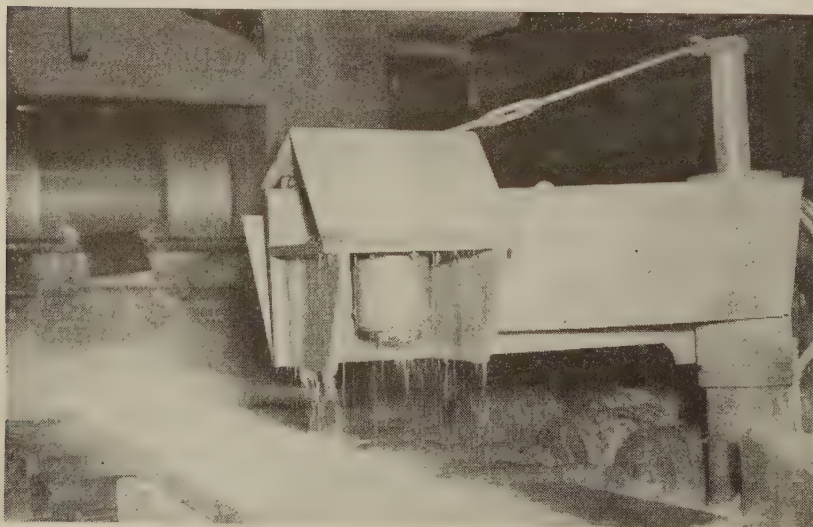
Mr. LaFontaine said he thought the plan would be workable in most countries. He expects most reticence to be overcome by the real need of countries to export a portion of their rising production. He said if European nations have trouble finding markets for their products it will interfere with their ability to buy from the U. S.

Plans Plant Addition

Windsor

• • • Canadian Motor Lamp Co., plans a plant addition here to provide 22,000 sq ft of floor space to be ready for occupation late in September. Total cost of building, equipment and machinery will be approximately \$440,000.

GAGING THICKNESS: A GE X-ray thickness gage in operating position along the runout table immediately beyond the finishing stands of Wierton Steel Co.'s 54-in. hot strip mill. The strip passes between the cylindrical detector shown in the picture and an X-ray tube located in an oil-filled tank beneath the runout table at a speed of approximately 1700 fpm. Strip thickness is measured continuously without contact.



Industrial Sales Of Natural Gas Running 14 Pct Above Last Year

Washington

• • • Industrial use of natural gas has increased by a wide margin over the past year, according to the March report on utilities issued by the Federal Power Commission.

Industrial sales are now running 14 pct above a year ago as compared with an overall increase of 11 pct for all consumption and a 4 pct rise in residential use. Sales to stores and other commercial establishments have increased approximately 3.8 pct.

For March 1949, 407,000 commercial customers were listed by the Class A and B companies, an increase of 20,000 or 5 pct. Industrial consumers were tabulated at 32,200, an increase of 1300 or 4.2 pct in a year's time.

Gas operating revenue for the 12 months ending Mar. 31 was up 17.1 pct over the previous 12 months. At the same time, the report said, operating expenses showed an increase of 20.9 pct and taxes increased 5.5 pct.

For this 12-month period, operating revenues amounted to \$916 million compared with \$782 million for the previous year. After deductions, the net income amounted to \$165 million against \$149 million for the previous year.

Adds to Production Costs

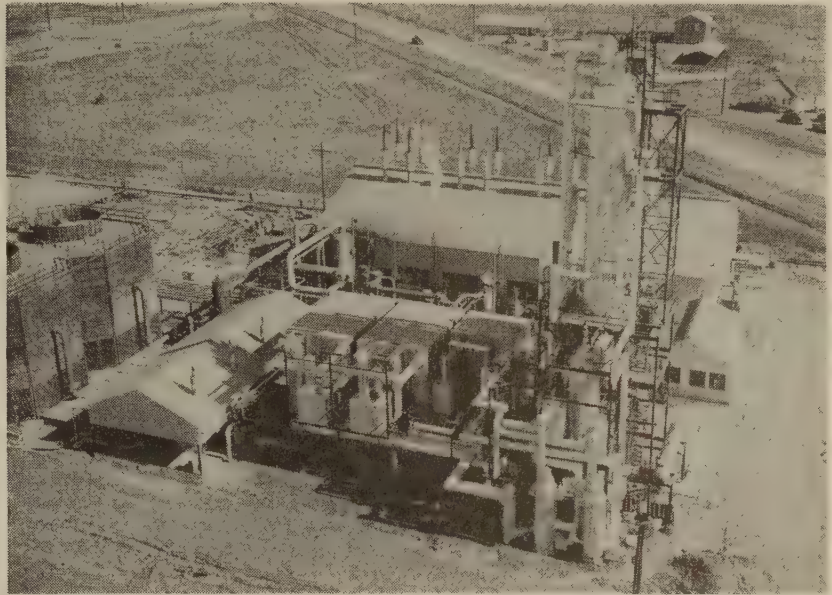
Los Angeles

• • • Although the company already has spent \$10,000 on tests for the control of air pollution, Aluminum Co. of America indicated recently that before complete smog equipment is operating, it will have spent \$80,000.

Operations such as this are making manufacturing more expensive in the Los Angeles area. Similar equipment is being installed by foundries and steel mills.

New plants coming into the area, however, appear to be planning waste disposal so as to put in control equipment at less expense.

Newest test for Alcoa will be \$12,000 supersonic dust-collecting device and an \$8,500 fog spray washer.



Tonnage Oxygen Plant Wins Its Spurs In Texas

Winnie, Texas

• • • Another milestone in the development of high purity, low-cost, tonnage oxygen for industry has been passed. This occurred in February when a unit for manufacturing large quantities of oxygen from air went on stream in the new plant of McCarthy Chemical Co. here. Current daily output is 175 tons of gaseous oxygen of 95 pct purity.

Engineered and constructed by Stacey-Dresser Engineering, Cleveland, the unit is the first major, low pressure, tonnage oxygen plant for the petrochemical industry. Oxygen leaves the plant at 1.5 to 2.5 psig and is compressed to 850 psig. It is delivered to petrochemical units for partial oxidation of methane to oxygenated products—methanol, acetaldehyde and formaldehyde.

Outstanding feature of the oxygen manufacturing installation is that it operates on an entirely self-contained Hydrocarbon Research cycle. Except for cooling water and a source of fuel gas, nothing is required for operation other than the air which is being processed.

Fractionation is normal and presents no unusual difficulties. Practical problems are introduced by the fact that liquefaction temperature of air at normal fractionating pressure is about -300°F . This means that before liquefaction the air must be freed of impurities which would be solid at liquid air temperature. In time this would plug lines and equipment. Economical production requires low costs for power and purifying. Happily these two requirements are not opposed.

Construction material selected for the low temperature area of the plant has been aluminum. Aluminum alloys were found not only capable of withstanding the extremely low temperatures without becoming brittle, but also were more economical. Some stainless steel and bronze alloys were also found to be satisfactory, but they are more expensive.

Stacey-Dresser believes this process may be designed to simultaneously produce a major stream of 90 to 95 pct purity oxygen for blast or openhearth furnace use and a relatively smaller stream of 99.5 pct purity oxygen for cutting and scarfing operations. Also, a portion of the nitrogen stream can be produced at high purity if necessary to meet a requirement for this product, the company said.

Senate Passes Bill To Permanently Legalize Freight Absorption

Washington

• • • The Senate last week passed legislation to legalize permanently freight absorption practiced in the absence of collusion.

The bill is now being scheduled for debate in the House, where favorable action is a probability, but not a certainty.

The upper chamber, acting with surprising speed, voted to lay aside the language of a bill (S. 1008) declaring a moratorium until July 1, 1950, on antitrust laws applying to pricing practices and passed by voice vote a substitute bill offered by Senator O'Mahoney, D., Wyo., which declares "nonconspiratorial" freight absorption permanently lawful.

The bill encountered little opposition in the Senate. Two Republicans, Senators Langer, of North Dakota, and Morse, of Oregon, denounced it as a measure designed to "tighten the strangle hold of monopoly upon a free-enterprise system in America." But a strong coalition of Democrats and Republicans forced passage of the bill on a voice vote.

Senator O'Mahoney told the Senate that enactment of the so-called moratorium bill sponsored by Senator Myers, D., Pa., would be "unwise" because it would amount to a "road block" against the investment of new capital during the period the moratorium would be in effect.

"Such a situation would stop the development of industries in the West as well as in the East and in the South," he said. "It would

bring about a condition which would prevail until 1950, until the Congress would again review the matter and decide whether freight absorption or delivered prices were to be condemned."

But O'Mahoney defended the Federal Trade Commission's stand on the delivered price issue, claiming that the only purpose of his bill was to reaffirm the FTC's position that individual freight absorption has been legal all the time.

Full text of the O'Mahoney bill as passed by the Senate and sent to the House follows:

S 1008

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

That the Federal Trade Commission Act (38 Stat. 719, as amended; 15 U. S. C. 45) is amended by adding at the end of section 5 (a) the following: "It shall not be an unfair method of competition or an unfair or deceptive act or practice for a seller, acting independently, to quote or sell at delivered prices or to absorb freight: Provided, that this shall not make lawful any combination, conspiracy, or collusive agreement; or any monopolistic, oppressive, deceptive, or fraudulent practice, carried out by or involving the use of delivered prices or freight absorption."

Sec. 2. Section 2 (a) of an act entitled "An act to supplement existing laws against unlawful restraints and monopolies and for other purposes," approved Oct. 15, 1914 (38 Stat. 730, as amended; 15 U. S. C. 13), is amended by substituting for the period at the end thereof a colon and adding thereto the following: "And provided further, That it shall not be an unlawful discrimination in price for a seller, acting independently—

"A. to quote or sell at delivered prices if such prices are identical at different delivery points or if differences between such prices are not such that their effect upon competition may be that prohibited by this section; or

"B. to absorb freight to meet the equally low price of a competitor in good faith (except where the effect of such absorption of freight will be to substantially lessen competition), and this may include the maintenance, above or below the price of such competitor, of a differential in price which such seller customarily maintains."

Sec. 3. Section 2 (b) of an act entitled "An act to supplement existing laws against unlawful restraints and monopolies and for other purposes," approved Oct. 15, 1914 (38 Stat. 730, as amended; 15 U. S. C. 13), is amended to read as follows:

"(b) Upon proof being made, at any hearing on a complaint under this section, that there has been discrimination in price the effect of which upon competition may be that prohibited by the preceding subsection, or discrimination in services or facilities furnished, the burden of showing justification shall be

upon the person charged with a violation of this section, and unless justification shall be affirmatively shown, the commission is authorized to issue an order terminating the discrimination: Provided further, That a seller may justify a discrimination (other than a discrimination which will substantially lessen competition) by showing that his lower price or the furnishing of services or facilities to any purchaser or purchasers was made in good faith to meet an equally low price of a competitor, or the services or facilities furnished by a competitor."

Sec. 4. As used in this act—

A. The word "price" shall have the meaning which it has under the commercial law applicable to the transaction.

B. The term "delivered price" shall mean a price at which a seller makes or offers to make delivery of a commodity to a buyer at any delivery point other than the seller's own place of business.

C. The term "absorb freight" shall mean to establish for any commodity at any delivery point a delivered price which, although as high as or higher than the seller's price for the same commodity at the point from which such commodity is shipped, is lower than the sum of the seller's price for such commodity at such point of shipment plus the actual cost to the seller for transportation of such commodity from such point of shipment to the delivery point or the average cost of transportation to the seller.

D. The term "the effect may be" shall mean that there is substantial and probative evidence of the specified effect.

In concluding his argument, Senator O'Mahoney said, "Nothing in the Cement Institute case, so far as I can see, should have occasioned anyone any concern," he declared. "The Cement Institute case is sound law and should be accepted as such. But immediately after it was announced, it was misinterpreted. I entertain the belief that in some cases it was deliberately misinterpreted."

And he added, significantly, that he "wanted to make sure that the system which has been used without criticism by the sugar-beet industry, of selling at delivered prices by absorbing freight, should not now be disturbed."

"There are several beet producers in my part of the country who are competing with one another," he stated. "I wanted to be sure that that great western industry was not being unduly affected by the decision."

Since the Supreme Court divided 4 to 4 on the issue of freight absorption in the rigid steel conduit industry, he declared that "the only possible relief that we could give was to speak clearly in Congress, stating what the FTC has said from the beginning; namely, that independent action without conspiracy is not prohibited."

But even assuming passage of the O'Mahoney bill in the House, what action will President Truman take? Will he sign such a bill? Many congressmen feel he will give 100 pct support to the FTC and send back any such legislation with a veto message.

Coming Events

June 5-10	Society of Automotive Engineers, summer meeting, French Lick, Ind.
June 12-16	Materials Handling Exposition, Chicago.
June 16-17	Malleable Founders Society, annual meeting, Hot Springs, Va.
June 20-22	National Assn. of Purchasing Agents, annual convention, Chicago.
June 27-30	American Electroplaters Society, annual meeting, Milwaukee.
June 27-	American Society for Testing Materials, annual meeting, Atlantic City, N. J.
July 1	
July 11-16	Concrete Reinforcing Steel Institute, annual meeting, White Sulphur Springs, W. Va.
Sept. 14-16	Porcelain Enamel Institute, annual forum, Columbus, Ohio.
Sept. 26-28	National Electronics Conference, Chicago.
Oct. 3-5	American Coke & Coal Chemicals Institute, annual meeting, Washington.

Townfolk Given More Time to Bid on Apollo Hand Sheet Steel Mill

Apollo, Pa.

••• By June 21 the citizens of Apollo may own a steel mill. In a frantic drive to raise funds to prevent liquidation of the town's only industry they pledged \$125,000 to buy the Apollo plant of Phoenix-Apollo Steel Co. Theirs was not the high bid but Phoenix-Apollo directors, meeting in Chicago June 1, voted to give the citizenry until June 21 to better their offer.

Decision to close the Apollo plant was forced by the company's inability to buy sheet bars cheaply

enough to make a competitive hot-rolled or galvanized sheet. The plant, which now employs 250, had a payroll of 750 at peak operations last year and earlier this year. It is scheduled to close June 30.

Faced with the prospect of losing their only industry, Apollo residents put on a frantic drive for funds during the last week in May. The plan is for the community organization to buy the plant and hold it for 4 to 6 weeks. During this time they would make a strong effort to sell to someone who would keep it running. They think there is a faint possibility that a group of sheet users in the district might combine to acquire it; not for profit but for an assured source of

sheet supply should the market turn tight.

The Apollo mill, located about 35 miles northeast of Pittsburgh, was acquired from the founding Oppenheimer interests on Jan. 1, 1947 by Phoenix-Apollo Steel Co. This concern, headed by Arnold H. Maremont, was made up of 25 steel fabricators, mostly located in the Chicago area. They paid about \$2 million for the plant, which has 14 main buildings, 29 auxiliary buildings and a 5400-sq ft office building. It has hand sheet mills and galvanizing pots. Hot-rolled sheet capacity is rated at 132,000 tons annually, of which 56,000 tons could be galvanized.

Canadian Production Ingots, Nonferrous Metals Ahead of '48

Toronto

••• Canadian production of steel ingots, nails and nonferrous metals in the early months this year attained a higher rate than in the like periods of 1948. For the first 4 months this year production of steel ingots totaled 1,072,200 net tons compared with 1,007,600 tons for the corresponding 4 months of 1948. For April ingot output amounted to 260,300 net tons compared with 287,900 tons in March and 254,300 tons in April 1948. In the first 4 months this year ingot production was at the average rate of 8943 tons per day compared with 8327 tons in the like months of 1948.

Production of iron and steel nails in the first 3 months this year amounted to 21,200 net tons compared with 19,600 tons in first quarter last year. For March production amounted to 7500 tons against 6500 tons in February and 7100 tons in March last year. Shipments of nails in first quarter this year amounted to 22,300 tons compared with 21,600 tons in the same months last year.

Nickel production in the first quarter this year was 34,600 tons compared with 30,900 tons in the first 3 months of 1948. For March production of nickel totaled 12,600 tons and compares with 10,500 tons in March 1948.

New primary copper produced

in the first quarter this year amounted to 64,200 tons against 60,600 tons in the like quarter of 1948. For March this year output amounted to 21,900 tons up from 21,100 tons in March 1948.

Ingot makers' stocks of nonferrous metal scrap in Canada at the end of February amounted to 2197 net tons compared with 1452 tons at the end of January. Stocks of secondary nonferrous ingots at the end of February amounted to 1705 tons compared with 1363 tons at the end of the preceding month. During February 2620 tons of secondary nonferrous ingots were produced while 2275 tons were used or sold.

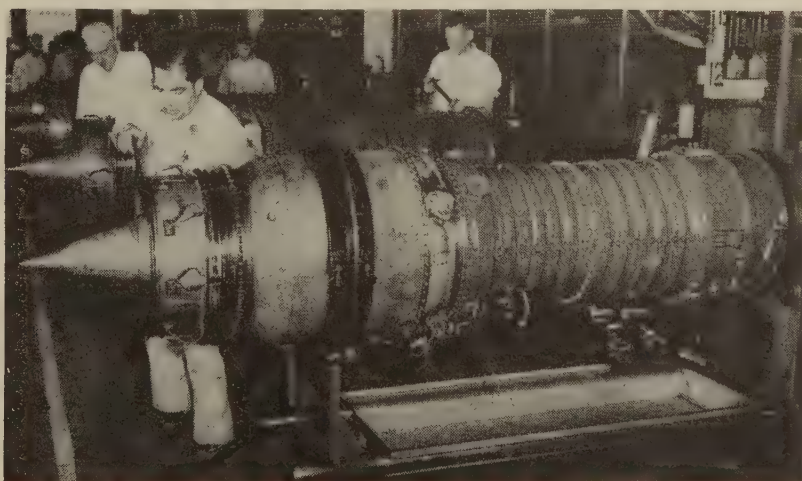
Number of Strikes Up With Lost Time Down

Washington

••• Although idleness has involved only half as many workers for the first 4 months of 1949 as last year, for the first time since enactment of the Taft-Hartley Act the number of strikes exceeded comparable previous periods.

The Bureau of Labor Statistics estimated that there were 500 strikes (including 400 new ones) in effect at one time or another during April. Lost time amounted to 1.8 million days, however, as compared with 3.6 million last year.

JET NO. 1000: The 1000th jet engine built at the Westinghouse plant for Navy and Air Force combat planes comes off the production line, with others close behind it. The engine, which produces more than 3000 lb of thrust, will be one of a pair in one of the Navy's fast McDonnell F2H "Banshee" shipboard fighters.



Carnegie-Illinois Fights \$2 Million Local Tax Jump

Pittsburgh

• • • Carnegie-Illinois Steel Corp. lost the first round in its attempt to have its 1949 Pittsburgh district taxes held in escrow pending appeal of a \$46 million assessment increase. U. S. Steel's biggest subsidiary has been handed tax bills totaling \$6 million, or \$2 million above the 1948 figure, by Alle-

gheny County and 11 municipalities in the county.

The boost followed a special appraisal of the steel company's machinery by an outside engineering firm. Machinery valuations of other manufacturing companies here were also boosted, either by direct appraisal in the survey or in proportion to the average increase.

The first tax payment for \$213,000 to the city of Duquesne was accepted on court order last week but the order was revoked the fol-

lowing day. Carnegie attorneys contended that the 1949 bill, which was \$100,000 higher than it was last year on the Duquesne Works, should be held in escrow until its appeal was heard. Common Pleas Court judges ruled, however that the law permitted this only when an appeal was pending in court. The company's appeal is still before the county tax appeals board.

Carnegie wanted the tax payments held in escrow so it would not have to pay interest and penalties if its appeal failed.

AMERICAN IRON AND STEEL INSTITUTE SHIPMENTS OF STEEL PRODUCTS ALL GRADES INCLUDING ALLOY AND STAINLESS (Net Tons)

APRIL - 1949
Month

Steel Products	Number of companies	Items	Current Month			To Date This Year		
			Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)
Ingots, blooms, slabs, billets, tube rounds, sheet and tin bars, etc.	47	1	222,560	4.0	217,557	1,149,507	5.0	1,052,176
Skelp	5	2	8,407	0.1	40,944	31,168	0.1	161,819
Wire rods	19	3	51,123	0.9	21,315	216,661	0.9	99,192
Structural shapes (heavy)	11	4	374,594	6.7	3,332	1,485,883	6.4	11,473
Steel piling	3	5	34,047	0.6	43	113,567	0.5	992
Plates	28	6	619,482	11.1	22,193	* 2,217,453	10.8	95,779
Rails—Standard (over 60 lbs.)	4	7	186,682	3.3	255	706,828	3.0	3,631
Rails—All other	5	8	12,603	0.2	502	59,323	0.3	1,014
Joint bars	7	9	10,657	0.2	4,596	46,797	0.2	14,115
Tie plates	6	10	40,956	0.7	-	157,265	0.7	41
Track spikes	8	11	9,740	0.2	-	44,703	0.2	35
Wheels (rolled or forged)	5	12	31,654	0.5	127	120,964	0.5	416
Axles	5	13	20,374	0.4	7	81,471	0.4	14
Hot rolled bars (including light shapes)	39	14	676,678	12.1	72,377	* 2,786,022	12.0	* 284,200
Hot rolled bars—Reinforcing	24	15	140,736	2.5	481	559,242	2.4	1,775
Cold finished bars	33	16	127,299	2.3	315	567,944	2.4	3,643
Tool steel bars	17	17	5,684	0.1	98	24,999	0.1	391
Pipe—Standard	16	18	205,226	3.7	5,443	789,035	3.4	20,227
Pipe—Line	12	19	204,084	3.6	1,766	800,658	3.5	8,371
Pipe—Oil country goods	14	20	120,488	2.2	7,417	524,181	2.3	32,864
Tubes—Boiler	3	21	12,358	0.2	875	43,733	0.2	4,228
Tubes—Mechanical and pressure	21	22	67,592	1.2	1,647	291,574	1.3	8,009
Miscellaneous pipe (including conduit)	12	23	24,829	0.4	62	101,454	0.4	846
Wire—Drawn	37	24	172,325	3.1	13,229	867,243	3.7	55,538
Wire—Nails and staples	17	25	73,704	1.3	1,037	305,020	1.3	4,633
Wire—Barbed and twisted	14	26	23,711	0.4	6	93,292	0.4	30
Wire—Woven wire fence	12	27	40,749	0.7	240	151,486	0.7	1,112
Wire—Bale ties	11	28	3,758	0.1	-	18,831	0.1	-
Black plate	10	29	42,899	0.8	125	238,476	1.0	168
Tin and terne plate—Hot dipped	9	30	147,556	2.6	-	589,018	2.5	10
Tin plate—Electrolytic	10	31	147,311	2.6	-	637,469	2.8	42
Sheets—Hot rolled	28	32	625,519	11.2	64,866	2,547,582	11.0	258,725
Sheets—Cold rolled	16	33	604,649	10.8	2,860	2,411,201	10.4	8,172
Sheets—Galvanized	15	34	143,170	2.6	26	568,787	2.5	281
Sheets—Long terne	8	35	13,365	0.2	5	52,713	0.2	353
Sheets—Enameling	7	36	16,394	0.3	339	78,633	0.3	740
Sheets—Electrical	11	37	33,720	0.6	-	166,394	0.7	-
Strip—Hot rolled	22	38	155,250	2.8	26,897	624,892	2.7	111,406
Strip—Cold rolled	34	39	144,192	2.6	1,959	630,524	2.7	8,486
All other	4	40	661	-	-	4,752	-	-
Total steel products	138	41	5,596,786	100.0	512,941	*23,216,745	100.0	*2,254,947

During 1948 the companies included above represented 99.5 % of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.

* Revised.

Continental Completes Air-Cooled Tank Engine

Muskegon, Mich.

••• The first air-cooled tank engine manufactured by Continental Motors Corp. under an \$18 million Ordnance Dept. contract was completed here recently. The first unit was an 810 hp 12-cylinder engine of a type accepted by the Army last summer. The new equipment will be standard in U. S. tanks.

Approximately 300 men are at work in Muskegon on tooling and machining assembly of the new air-cooled engines. The expenditure for machine tools is approximately \$9 million. According to C. J. Reese, Continental Motors president, between 1200 and 1500 men will be employed in two plants when peak output is reached next winter. A rapid increase in the scheduled production of the new engines is expected within 60 days, Mr. Reese said.

Granite City Expanding

Granite City, Ill.

••• Granite City Steel Co. has started construction of a new 185-ton openhearth that will increase its capacity by 100,000 to 120,000 ingot tons a year. The unit will be the fourth to be installed in the new openhearth shop, built here during the war. The contract for the openhearth and its auxiliaries, a \$1.5 million project, has been awarded to Rust Engineering Co., Pittsburgh.

Rust, which will build the furnace from the foundations up, will also design and build a 175 ft x 6 ft ID reinforced concrete chimney; a 25 ft extension of the furnace building's pouring bay and 250 ft of scrap car track extension.

Armco Declares Dividend

Middletown, Ohio

••• A preferred dividend of \$1.12½ per share on the 4½ pct cumulative convertible preferred stock was declared May 23 by directors of Armco Steel Corp.

The preferred dividend will be payable July 15, 1949 to shareholders of record June 15, 1949.

The Armco board is holding its May meeting in Baltimore and is inspecting the Rustless plant of the company there and the Baltimore plant of Armco Drainage & Metal Products, Inc.



Tramway Links Inaccessible Mountainous Terrain

Trenton, N. J.

••• The new monocable tramway recently installed by Cerro de Pasco Copper Corp., Peru, S. A., is a vital link in the 100-mile system of transportation to the new mine at Yauricocha. The tramway, designed and manufactured by John A. Roebling's Sons Co., Trenton, N. J., runs for 10 miles over mountainous terrain, where no other means of mechanized transport is feasible. It is one of the highest tramway installations in the world, rising to an elevation of 15,500 ft.

The tramway has a capacity of 45 tons per hr, with some 300 ¾-ton buckets carried over 100 steel towers on a 1⅝-in. diam wire rope running cable. An idea of the scope of the project can be gained from the following construction details: 1000 tons of structural steel and machinery were used, 180 tons of wire rope, 150,000 board feet of lumber and 22,000 cu yd concrete.

Most of the work was done manually, from mixing the concrete, drilling rock for blasting to the erection of the steel members. All materials were pack-carried to the work sites either by porters or llamas. To pull the 1⅝-in. wire rope off the 10-ton reels and haul it into position over the towers often required the simultaneous efforts of as many as 500 men.

Incorporated into the tramway layout, eliminating some very high towers, were two suspended crossings. The longest has a free span of 3400 ft and falls 100 ft short of the length of the George Washington Bridge. Swung 1000 ft above the valley floor, this bridge contains no conventional stiffening whatever. The arrangement consists of three cable levels, the supporting cables above, a cable deck and an inverted curve sway dampening system below. Supported at the deck level is a 3-ft wide wire-mesh walkway for access to the tramway supporting sheave units which are spotted at 500-ft intervals.

ECA Authorizes Funds for Austrian Continuous Billet Mill, Iron Ore Mining

Washington

•••The Economic Cooperation Administration last week approved two basic recovery projects for Austria, one for a continuous billet mill at Donawitz and the other to rehabilitate iron ore mining in the historic Erzberg field, Styria.

The new continuous billet mill at Donawitz will handle semi-finished products now rolled on out-dated, inefficient and high cost mills. In conjunction with the use of existing equipment at this site, it will furnish capacity to roll 33,000 tons of semifinished and finished products per month as against present rated capacity of 25,000 tons per month.

Total cost of the Donawitz project is estimated at the dollar equivalent of \$7,230,000, including \$3,451,000 in ECA assistance funds and 37,790,000 schillings (\$3,779,000) in local funds.

At Erzberg, 1948 iron ore production was only 980,000 tons compared to average prewar production of 2,000,000 tons annually. The mining concentration and transport equipment necessary to the rehabilitation project is expected to increase present production by 57 pct while increasing the

labor force only 19 pct. The new equipment and increased output are expected to bring about lower costs per ton.

Total cost of the Erzberg project is estimated at the dollar equivalent of \$5,200,000, including \$2,145,267 in ECA assistance funds and 30,616,000 schillings (\$3,060,000) in local funds.

ECA funds in each case will be used to purchase machinery and equipment and parts in the United States and to pay ocean freight charges. The local funds will be spent in Austria for construction costs and materials and parts available locally.

The Donawitz plant is the largest integrated iron and steel plant in Austria. The existing semi-fining mills date back to 1897, and are driven by steam power. The output of the new continuous billet mill will be distributed as follows: 60 pct directly to Donawitz's own finishing mills for wire, bars, etc.; about 20 to 25 pct to other plants of the company; and the remainder to other Austrian rerolling and finishing plants.

Mechanical and electrical equipment and parts for the new continuous billet mill, to be purchased

in the United States, will cost an estimated \$3,151,000 — \$2,751,000 for the mechanical and \$400,000 for the electrical, complete with power supply. Ocean freight charges are estimated at \$300,000.

In the Erzberg, at Eizenerz, Styria, Austria has one of the principal iron deposits in Europe. Because of the high manganese content, the pig iron provided from this area is of a first-rate steel-making grade. As early as the Middle Ages, ore from this area was the essential base for Styrian iron production.

A small part of the ore now being mined comes from underground shaft mining. The principal part comes from strip mining on the face of Erzberg Mountain from 30 open cuts or terraces. At present, only 10 of the 30 open pit terraces are being worked.

Phoenix Iron Co. Closed Bridge Corp. Continues

Phoenixville, Pa.

•••After several months of intermittent operations, the Phoenix Iron Co. plant here was closed down on a permanent basis on June 3. A wholly owned subsidiary, the Phoenix Bridge Corp., will continue operations. Action was taken by the Kaiser & Frazer Parts Corp., Willow Run, Mich., which bought out the plant some time ago.

Negotiations have been under way for months with two groups of prospective buyers, one group now operating steel plants and the other made up of steel warehouse interests. It is understood that negotiations are continuing with the interested groups.

The Phoenix Bridge Corp. will have to buy steel in the open market after using up present heavy inventories. But ever since the development of wide flange beams for structural work the ingot operations of the steel plant served only 20 to 30 pct of the company's steel requirements. Clyde McCormac, vice president, will be the chief operating official of the bridge company.

It is understood that the steel plant will be held in standby condition. The Kaiser-Frazer interests have no intention of selling the plant for scrapping.



BETATRON MAGNET: Machining a magnet slab for a 100 MEV (million electron volts) betatron. The betatron magnet, built at GE's Pittsfield Works, weighs 160 tons. Before assembling the magnet core all of the contact surfaces were machined to a tolerance of plus 0.010 in. In the case of the top and bottom yoke pieces, the same tolerance was maintained over an area 15 by 7 ft.

Sudden Turnabout In Aluminum Market Causes Producers to Seek New Customers

By JOHN ANTHONY
Eastern Regional Editor

New York

• • • The complete change in the aluminum market in the last month or so has prompted aluminum producers to cast about anxiously for markets to supplement their present ones. All producers are seeking export tonnage now. But the outlook is bleak, indeed, with the lucrative Western European markets preempted by the operation of the European Recovery Program. ECA aluminum comes almost entirely from Canada.

Until recently, this was a very desirable arrangement, for it protected domestic aluminum consumers from the loss of metal which was badly needed in the United States. Now, however, the domestic industry is confronted by shrinking markets and the necessity for reduced operations until demand improves. Meanwhile power costs, which are on a yearly basis, go on unchecked as a charge against operations.

Some producers have already consulted with ECA officials on the possibility of obtaining a portion of ECA business in order to round out their order books. Now Senator Harry P. Cain of Washington is reported to have proposed to Paul Hoffman, ECA Administrator, that European countries using ECA foreign aid money for aluminum purchases be required to buy from American producers whenever an excess domestic supply exists. He also is reported to have suggested that whenever a country receiving ECA aid buys aluminum with its own funds, the ECA grant be reduced proportionately.

There are a number of obstacles in attempting to reorient the buying of aluminum by ECA nations, chief among which is the lower cost of Canadian aluminum. The bulk of ECA aluminum buying is

done by the United Kingdom which accounts for 80 to 85 pct of the total tonnage. Britain has taken Canadian aluminum for many years under a long term contract renewed yearly at a price which is now several cents a pound lower than that charged by the domestic producers. It would constitute a major change in ECA policy to require purchase of United States aluminum at prices higher than obtainable elsewhere. Heretofore, ECA has insisted on the purchase of all commodities by ECA nations wherever the cost has been lowest.

ECA is, moreover, primarily a fund granting agency designed to aid the recovery of Western Europe. If there were to be a change in this policy, it would call for a major decision by the Administration. In the case of some other non-ferrous metals now in ample supply in the United States, such as copper, lead, zinc and brass mill products, where domestic prices are lower than those obtainable from abroad, ECA officials are understood to be funneling as much

business as possible to United States suppliers.

Authorizations for ECA purchases of aluminum to the end of last year totaled 165,000 metric tons.

Sears Opens Second Retail Store in Brazil

Chicago

• • • Sears Roebuck Co. on Monday, June 6, will open a large retail store in Rio de Janeiro. This will be the second store by Sears to be opened in Brazil. On Mar. 15 of this year a similar sized store was opened in Sao Paulo, Brazil's industrial center.

Most of the personnel will be hired locally except a small group of supervisory personnel which will be sent down from Sears' executive staff in this country. It is anticipated that around 70 pct of the goods sold in both Sears Brazilian stores will be manufactured in that country. Sears now operates large retail stores in Havana and Mexico City. An additional store is under construction in Caracas, Venezuela, and Sears has a branch retail unit in Santa Clara. Further plans for more stores in the Central American countries are under study.

BROACHING BUMP BUFFERS: Four tubes are broached simultaneously in making the interior cylinders of Houdaille-Hershey aircraft-type shock absorbers. The stock, which is Jones & Laughlin's electricweld tubing of free machining steel is broached to a tolerance of 0.001 in. Here the operator gages the ID of a tube.



Construction Steel . . .

• • • Fabricated steel awards this week included the following:

- 5000 Tons, Elizabeth, Pa., bridge over the Monongahela River, to Fort Pitt Bridge Co., Pittsburgh.
- 1335 Tons, St. Joseph, Mich., railroad grade separation bridge to American Bridge Co., Pittsburgh.
- 1115 Tons, Idlewild, N. J., International Airport to American Bridge Co., Pittsburgh.
- 800 Tons, Swatara Creek, Dauphin Co., Pa., Pennsylvania Dept. of Highways, to J. H. Wickersham, Lancaster, Pa., general contractor.
- 160 Tons, Pittsfield and Williamstown, Mass., bridges over Housatonic River, Pittsfield and Green River, Williamstown, to West End Iron Works, Cambridge, Mass.

• • • Fabricated steel inquiries this week included the following:

- 5000 Tons, Washington, D. C., Senate Office Building, due June 22.
- 2735 Tons, Waverly, Tenn., transmission towers for TVA.
- 1500 Tons, Chester Co., Pa., three projects for Pennsylvania Turnpike Commission, due July 6.
- 585 Tons, Lancaster, Pa., Pennsylvania Turnpike Commission, due July 11.

- 575 Tons, Eugene, Ore., bridge over Willamette River on Coburg Rd., Oregon State Highway Commission, Portland, bids to June 28.
- 300 Tons, Hudson Co., N. J., bridge, Pennsylvania Dept. of Highways, due June 16.
- 285 Tons, Brewster, Wash., Okanogan River bridge on access highway to Chief Joseph Dam, Seattle District, Corps of Engineers, Ser. Eng-45-108-49-182. Bids to June 24.
- 200 Tons, Union Co., N. J., bridge, Pennsylvania Dept. of Highways, due June 9.
- 170 Tons, Livingston, Mont., underpass under Northern Pacific Railroad, Montana Highway Commission, Helena. Bids to June 9.
- 165 Tons, Boston, reconstruction of Water St. underpass for Boston approach to Mystic River Bridge, Farrina Bros., Newton, Mass., low bidder.
- 120 Tons, Littleton, N. H., reinforced concrete slab bridge and asphalt concrete approaches. O. W. Miller, Inc., Ludlow, Mass., low bidder.

• • • Reinforcing bar awards this week included the following:

- 875 Tons, Dayton, Ohio, Intercepting sewer through Charles Shook Co., Dayton, to West Virginia Steel Co.
- 475 Tons, Chicago, Roscoe Street sewer for City of Chicago, through John C. Tully Co., Chicago, to U. S. Steel Supply Co.

- 215 Tons, Cleveland, Woolworth Bldg., through Builders Structural Steel Co., Cleveland, to Youngstown Sheet & Tube Co., Youngstown.
- 145 Tons, La Grange, Ill., Nazareth Academy building through Dean Steel Co., Chicago, to Republic Steel Co., Cleveland.
- 190 Tons, Milwaukee, building for American Can Co., through Turner Construction Co., New York, to U. S. Steel Supply Co.

• • • Reinforcing bar inquiries this week included the following:

- 1700 Tons, Madison, Wis., Veterans hospital, Gus K. Newberg Construction Co. of Chicago, low bidder.
- 345 Tons, Yuma, Ariz., canal structures, Wellton-Mohawk Canal, Bureau of Reclamation, Yuma, Spec. 2688. Bids to June 28.
- 300 Tons, St. Joseph, Mich., Memorial hospital building.
- 200 Tons, Blue Island, Ill., Community high school building.
- 200 Tons, Eugene, Ore., bridge over Willamette River on Coburg Rd., Oregon State Highway Commission, Portland. Bids to June 28.
- 135 Tons, Jefferson, Wis., courthouse.
- 100 Tons, Dexter, Ore., railroad relocation and highway relocation, Portland District, Corps of Engineers, Ser. Eng-35-026-49-510. Bids to June 14.

• • • Railroad car awards and inquiries this week included the following:

- Canadian Pacific Railroad is inquiring for 250 to 500 refrigerator cars.
- The Southern Railroad has ordered 200 70-ton hopper cars from Pullman Standard Car Mfg. Co. at Bessemer, Ala.

50 YEARS AGO

THE IRON AGE, June 8, 1899

• "As briefly reported by telegraph in THE IRON AGE of last week the opening of bids to supply the 24,000 tons of armor required for the four monitors and three battleships authorized by the act of 1898 and the three battleships and armored cruisers provided by the act of 1898."

• "A press dispatch from Colon, Columbia, says that the local press is discussing a proposal of a party in Panama who are desirous of annexation to the United States."

• "The State Dept. has made public an abstract of the report of the Nicaragua Canal Commission, of which Rear Admiral Walker is the head, which will be presented to Congress at the next session."

• "The Mountain Iron mine of the Oliver Co., Mesabi range, is having constructed by the Barnharts an 85-ton shovel on the ranges."

• "The sales agency of the various anthracite mining companies at their meeting last week decided to hold prices during June and advance them 25¢ on July 1 and 25¢ on September 1, also to restrict mining operations to 2 days one week and 3 days the next week."

• "Paper money cannot be used in the Philippines on account of the omnivorous white ant which infests the islands and which is particularly partial to paper."

• "Workmen from the Chicago Shipbuilding Co.'s yards have been sent to England to introduce in the shipyards of that country pneumatic riveting machines of American manufacture."

• "Reports from manufacturers of wagons, carriages and pleasure vehicles throughout the country indicate that business in their line is better than in 10 years past."

Rich Ore Deposit Found In Dominican Republic

New York

• • • Rich deposits of iron ore are reported to have been found in Duarte Province, Dominican Republic, according to the Dominican Information Center here. Duarte Province is in the north-eastern part of the Republic.

The deposits are estimated to hold 43 million tons of ore of 67 pct iron content. A United States steel company is exploring the deposits.

The center reported that the Dominican Republic would like to assure itself of an adequate supply of steel and iron for domestic use and would like to have these supplies produced at home. Hence it expects the government to lean heavily toward establishment of a domestic smelter to take care of the domestic development, in cooperation with private interests.

Coal suitable for smelter use is also reported to be present near the iron ore deposits for eventual establishment of an iron and steel industry in the Republic.

SINCE 1846

BAIRD HIGH PRODUCTION MACHINES

- For producing articles made of wire, ribbon metal, castings, forgings or cut off bar stock.

- BAIRD 76H Chucker is an Automatic 7" Six Spindle, Indexing, Horizontal Lathe with different speeds available at the work spindles for different operations in the one handling of a piece and with other time saving features.

- BAIRD 54VC Lathe is an automatic 5" Four Spindle, Vertical Continuous Machine for many light or finishing cuts on parts, as facing ends or chamfering grooves on pistons, etc.

- BAIRD 12-Station Duplex Turning Machine is for such as turning the four trunnions on the "spider" or journals for universal joints and boring and facing the yokes of such joints.

- BAIRD Multiple Transfer Presses for multiple operation in one handling on articles made from ribbon metal.

BAIRD ALSO MAKES

- BAIRD Four Slide Wire and Ribbon Metal Forming Machines in many sizes to cover the thousands of articles made from wire and ribbon metal.

- Baird Tumbling Equipment for deburring, smoothing, cleaning, polishing, ball burnishing, heated drying, etc.

Send samples of each article you want to make in quantity.

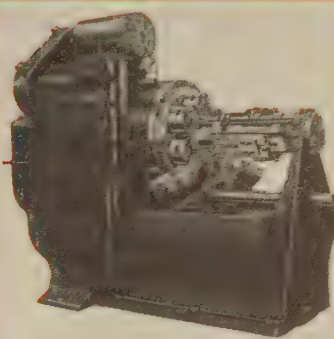
State the quantities to be made of each piece you want to make in a given time.

Give electrical current specifications AND

Ask Baird About It



BAIRD 12 STATION DUPLEX TURNING



BAIRD 76H CHUCKING MACHINE



BAIRD 54VC LATHE



BAIRD MULTIPLE TRANSFER PRESS



THE BAIRD MACHINE COMPANY

1700 STRATFORD AVENUE
STRATFORD, CONN.

Construction Steel . . .

••• Fabricated steel awards this week included the following:

- 5000 Tons, Elizabeth, Pa., bridge over the Monongahela River, to Fort Pitt Bridge Co., Pittsburgh.
- 1335 Tons, St. Joseph, Mich., railroad grade separation bridge to American Bridge Co., Pittsburgh.
- 1115 Tons, Idlewild, N. J., International Airport to American Bridge Co., Pittsburgh.
- 800 Tons, Swatara Creek, Dauphin Co., Pa., Pennsylvania Dept. of Highways, to J. H. Wickersham, Lancaster, Pa., general contractor.
- 160 Tons, Pittsfield and Williamstown, Mass., bridges over Housatonic River, Pittsfield and Green River, Williamstown, to West End Iron Works, Cambridge, Mass.

••• Fabricated steel inquiries this week included the following:

- 5000 Tons, Washington, D. C., Senate Office Building, due June 22.
- 2735 Tons, Waverly, Tenn., transmission towers for TVA.
- 1500 Tons, Chester Co., Pa., three projects for Pennsylvania Turnpike Commission, due July 6.
- 585 Tons, Lancaster, Pa., Pennsylvania Turnpike Commission, due July 11.

- 575 Tons, Eugene, Ore., bridge over Willamette River on Coburg Rd., Oregon State Highway Commission, Portland, bids to June 28.
- 300 Tons, Hudson Co., N. J., bridge, Pennsylvania Dept. of Highways, due June 16.
- 285 Tons, Brewster, Wash., Okanogan River bridge on access highway to Chief Joseph Dam, Seattle District, Corps of Engineers, Ser. Eng-45-108-49-182. Bids to June 24.
- 200 Tons, Union Co., N. J., bridge, Pennsylvania Dept. of Highways, due June 9.
- 170 Tons, Livingston, Mont., underpass under Northern Pacific Railroad, Montana Highway Commission, Helena. Bids to June 9.
- 165 Tons, Boston, reconstruction of Water St. underpass for Boston approach to Mystic River Bridge. Farrina Bros., Newton, Mass., low bidder.
- 120 Tons, Littleton, N. H., reinforced concrete slab bridge and asphalt concrete approaches. O. W. Miller, Inc., Ludlow, Mass., low bidder.

••• Reinforcing bar awards this week included the following:

- 875 Tons, Dayton, Ohio, Intercepting sewer through Charles Shook Co., Dayton, to West Virginia Steel Co.
- 475 Tons, Chicago, Roscoe Street sewer for City of Chicago, through John C. Tully Co., Chicago, to U. S. Steel Supply Co.

- 215 Tons, Cleveland, Woolworth Bldg., through Builders Structural Steel Co., Cleveland, to Youngstown Sheet & Tube Co., Youngstown.

- 145 Tons, La Grange, Ill., Nazareth Academy building through Dean Steel Co., Chicago, to Republic Steel Co., Cleveland.
- 190 Tons, Milwaukee, building for American Can Co., through Turner Construction Co., New York, to U. S. Steel Supply Co.

••• Reinforcing bar inquiries this week included the following:

- 1700 Tons, Madison, Wis., Veterans hospital, Gus K. Newberg Construction Co. of Chicago, low bidder.
- 345 Tons, Yuma, Ariz., canal structures, Wellton-Mohawk Canal, Bureau of Reclamation, Yuma, Spec. 2688. Bids to June 28.
- 300 Tons, St. Joseph, Mich., Memorial hospital building.
- 200 Tons, Blue Island, Ill., Community high school building.
- 200 Tons, Eugene, Ore., bridge over Willamette River on Coburg Rd., Oregon State Highway Commission, Portland. Bids to June 28.
- 135 Tons, Jefferson, Wis., courthouse.
- 100 Tons, Dexter, Ore., railroad relocation and highway relocation, Portland District, Corps of Engineers, Ser. Eng-35-026-49-510. Bids to June 14.

••• Railroad car awards and inquiries this week included the following:

- Canadian Pacific Railroad is inquiring for 250 to 500 refrigerator cars.
- The Southern Railroad has ordered 200 70-ton hopper cars from Pullman Standard Car Mfg. Co. at Bessemer, Ala.

50 YEARS AGO

THE IRON AGE, June 8, 1899

• "As briefly reported by telegraph in THE IRON AGE of last week the opening of bids to supply the 24,000 tons of armor required for the four monitors and three battleships authorized by the act of 1898 and the three battleships and armored cruisers provided by the act of 1898."

• "A press dispatch from Colon, Columbia, says that the local press is discussing a proposal of a party in Panama who are desirous of annexation to the United States."

• "The State Dept. has made public an abstract of the report of the Nicaragua Canal Commission, of which Rear Admiral Walker is the head, which will be presented to Congress at the next session."

• "The Mountain Iron mine of the Oliver Co., Mesabi range, is having constructed by the Barnharts an 85-ton shovel on the ranges."

• "The sales agency of the various anthracite mining companies at their meeting last week decided to hold prices during June and advance them 25¢ on July 1 and 25¢ on September 1, also to restrict mining operations to 2 days one week and 3 days the next week."

• "Paper money cannot be used in the Philippines on account of the omnivorous white ant which infests the islands and which is particularly partial to paper."

• "Workmen from the Chicago Shipbuilding Co.'s yards have been sent to England to introduce in the shipyards of that country pneumatic riveting machines of American manufacture."

• "Reports from manufacturers of wagons, carriages and pleasure vehicles throughout the country indicate that business in their line is better than in 10 years past."

Rich Ore Deposit Found In Dominican Republic

New York

••• Rich deposits of iron ore are reported to have been found in Duarte Province, Dominican Republic, according to the Dominican Information Center here. Duarte Province is in the north-eastern part of the Republic.

The deposits are estimated to hold 43 million tons of ore of 67 pct iron content. A United States steel company is exploring the deposits.

The center reported that the Dominican Republic would like to assure itself of an adequate supply of steel and iron for domestic use and would like to have these supplies produced at home. Hence it expects the government to lean heavily toward establishment of a domestic smelter to take care of the domestic development, in co-operation with private interests.

Coal suitable for smelter use is also reported to be present near the iron ore deposits for eventual establishment of an iron and steel industry in the Republic.

SINCE 1846

BAIRD HIGH PRODUCTION MACHINES

- For producing articles made of wire, ribbon metal, castings, forgings or cut off bar stock.

- BAIRD 76H Chucker is an Automatic 7" Six Spindle Indexing, Horizontal Lathe with different speeds available at the work spindles for different operations in the one handling of a piece and with other time saving features.

- BAIRD 54VC Lathe is an automatic 5" Four Spindle Vertical Continuous Machine for many light or finishing cuts on parts, as facing ends or chamfering grooves on pistons, etc.

- BAIRD 12-Station Duplex Turning Machine is for such as turning the four trunnions on the "spider" or journals for universal joints and boring and facing the yokes of such joints.

- BAIRD Multiple Transfer Presses for multiple operation in one handling on articles made from ribbon metal.

BAIRD ALSO MAKES

- BAIRD Four Slide Wire and Ribbon Metal Forming Machines in many sizes to cover the thousands of articles made from wire and ribbon metal.

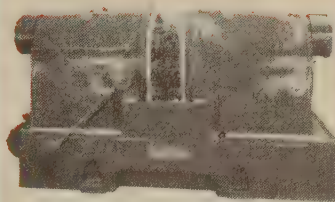
- Baird Tumbling Equipment for deburring, smoothing, cleaning, polishing, ball burnishing, heated drying, etc.

Send samples of each article you want to make in quantity.

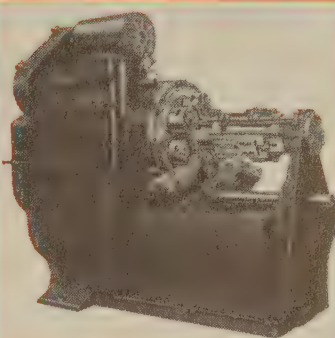
State the quantities to be made of each piece you want to make in a given time.

Give electrical current specifications AND

Ask Baird About It



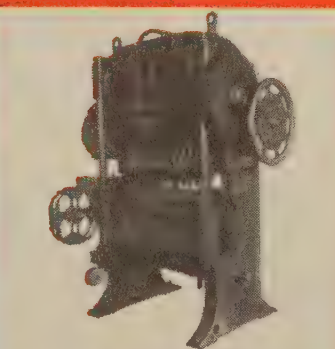
BAIRD 12 STATION DUPLEX TURNING



BAIRD 76H CHUCKING MACHINE



BAIRD 54VC LATHE



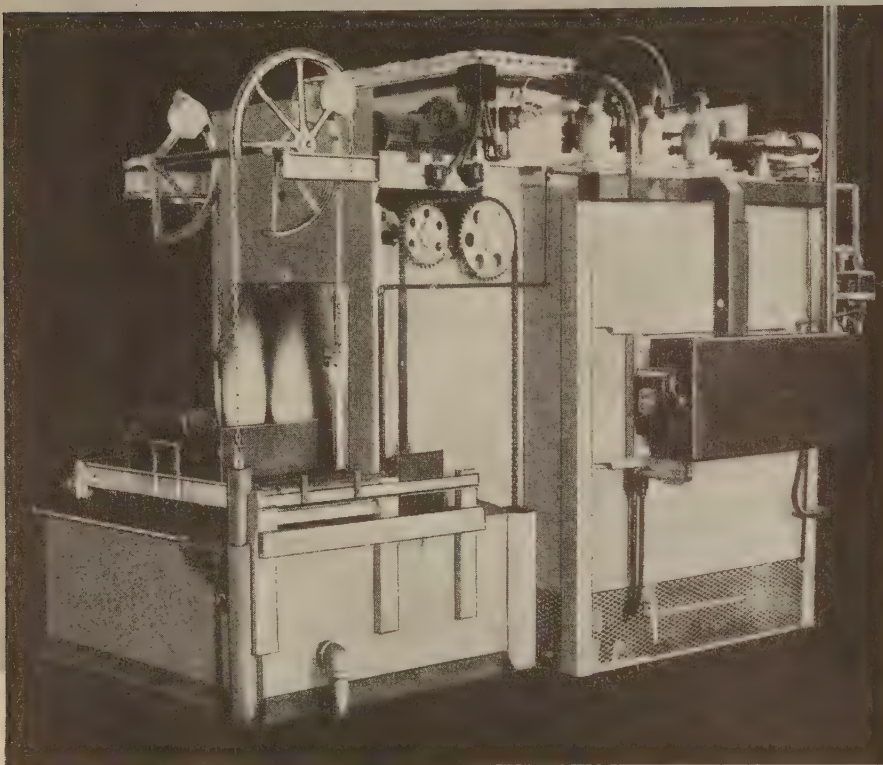
BAIRD MULTIPLE TRANSFER PRESS



THE BAIRD MACHINE COMPANY
1700 STRATFORD AVENUE
STRATFORD, CONN.

Outstanding Performance and Economy

UNMATCHED BY ANY OTHER FURNACE



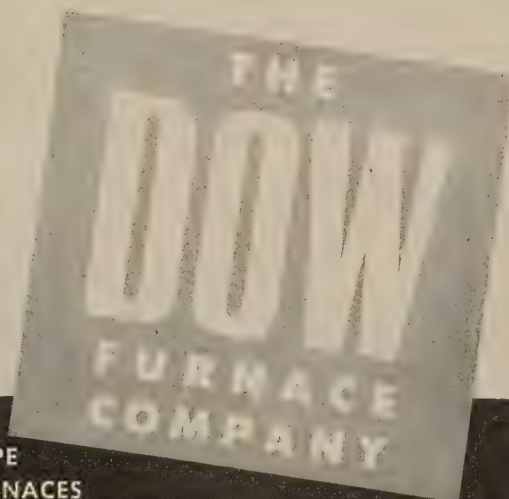
DOW controlled atmosphere furnaces are in greater demand than any other type of furnace on the market today! No wonder more than half of the original purchasers of Dow Furnaces have bought their second or third units! Users report reductions in cost of more than 65% over their previous methods.

Check Dow's time-proven advantages with your own present heat treating methods and . . . have a Dow engineer analyze your production to prove that a modern heat treating department can be amortized in a few months.

The Dow Furnace

- Cuts cyaniding costs to 1/2¢ or less per pound
- Assures uniform case depths throughout a furnace load on light case work
- Gives unmatched versatility in types of parts treated—whether gas cyaniding, gas carburizing, or clean hardening
- Assures maximum production from minimum floor space
- Improves working conditions, reduces health hazards

FIRST
WITH MECHANIZED BATCH-TYPE
CONTROLLED ATMOSPHERE FURNACES



Maccabees Building

Detroit 2, Michigan

Aircraft Industry

Advisory Committee

Holds First Meeting

Washington

••• F. C. Crawford, president, Thompson Products, Inc., of Cleveland, was elected Industry Chairman of the Munitions Board Aircraft Industry Advisory Committee at its first meeting recently, at the Pentagon in Washington.

The committee is composed of representatives of aircraft and component manufacturers, and other companies which may be called on to produce aircraft, engines, or parts in the event of mobilization. It serves both the Munitions Board and the National Security Resources Board.

A subcommittee to study security problems in individual plants will include L. C. Goad, vice-president, General Motors Corp., Detroit, chairman; LaMotte Cohu, president, Consolidated Vultee Aircraft Corp., San Diego; and C. E. Wilson, president, General Electric Co., Schenectady.

Another subcommittee will study the industry's relations to subcontractors with particular reference to the mobilization program. Chairman is Malcolm P. Ferguson, president, Bendix Aviation Corp., Detroit; and members are J. H. Kindelberger, president, North American Aviation, Inc., Los Angeles, and J. Carlton Ward, Jr., president, Fairchild Engine & Airplane Corp., Hagerstown, Md.

A subcommittee on subcontracting will also study a request by Dr. Richard H. Rush, director of the National Security Resources Board's aircraft division, for an advisory committee view on desirability of setting up a detailed mobilization plan for suppliers of component parts.

Those present from industry were:

LaMotte Cohu, president, Consolidated Vultee Aircraft Corp., San Diego; J. H. Kindelberger, president, North American Aviation, Inc., Los Angeles; G. F. Titterton, Grumman Aircraft Engineering Corp., Bethpage, N. Y.; Harry T. Rowland, vice-president (alternate for Glenn L. Martin, president), Glenn L. Martin Co., Baltimore; J. Carlton Ward, Jr., president, Fairchild Engine & Airplane Corp., Hagerstown, Md.; Thomas Knowles, Goodyear Aircraft Corp., Akron, Ohio; F. C. Crawford, president, Thompson Products, Inc., Cleveland; C. C. Pearson, executive assistant to the president, Curtiss-Wright Corp., Woodridge, N. J.; H. M. Horner, president, United Aircraft Corp., E. Hartford, Conn.; L. C. Goad, vice-president (alternate for T. M. Archer, vice-president), General Motors Corp., Detroit; M. P. Ferguson, president, Bendix Aviation Corp., Detroit.

Amazing Secret Process— Carnegie-Illinois Using New Galvanizing Method

By HI HOWARD

Carnegie-Illinois Steel Corp. today took the wraps off an amazing new industrial process at its huge Irvin Works here—a production line for continuously galvanizing a wide ribbon of steel.

Advantages claimed are both greatly increased output and higher quality.

Galvanizing is the process of coating steel with zinc to protect it against rust and corrosion.

As this work is done in all other steel plants now, the steel is first cut into flat squares or rectangles which are fed through a bath of molten zinc.

In the new Carnegie-Illinois process, the strip of steel flows continuously through the molten zinc bath, and can be sold either cut up into sheets or in coil form.

NEW FURNACE—

The secret of the new process is a new-type furnace with a controlled atmosphere, mostly a mixture of hydrogen and nitrogen with as much air excluded as possible.

As the strip steel enters this 117-foot long furnace, electricity heats it red hot and then the hydrogen and nitrogen gases gradually cool it to just above the temperature of the molten zinc.

This "continuous" furnace, officials explain, replaces conventional box furnace annealing—a method which now requires from 10 to 12 days to soften coils of sheet steel. In addition, the controlled atmosphere of the furnace eliminates the necessity of another batch "pickling" process to clean the steel.

HEAVY SHEETS—

The galvanizing line now operating at Irvin Works produces heavy sheets, about one-tenth of an inch thick. Another similar line is under construction—with completion expected in early spring—to produce galvanized strips and sheets in the lighter, thinner gauges.

Output of the heavy material is now at the rate of about 300 tons per day, equal to about 100,000 tons annually. Completion of the second line will make it possible to double this production.

There is an excellent demand now for galvanized strip and sheet. The heavier sheets go principally into railroad car roofing, culvert pipe, storage tanks, heavy drums, and railroad refrigerators. The lighter sheets and strip are used for roofing, siding, gutters, builders' specialties, and other products.

GIVES EDGE—

Carnegie-Illinois development of a continuous galvanizing process appears to give this U. S. Steel subsidiary an edge over its competitors in the marketing of a product which is usually sold in a highly competitive market.

The company constructed its new line behind barricades and went to elaborate precautions to maintain secrecy. But patent applications are now being made.

No announcement has been made of the investment involved in the new process. But it was obvious that the buildings, machinery, and equipment involved represents a very large sum—estimated at several millions. The new line itself is nearly 500 feet long.

Over and above the increase in output, improved quality is the greatest advantage, according to J. E. Lose, vice president in charge of operations, Carnegie-Illinois Steel.

● Another milestone . . .

Bold planning, continuous research and progressive thinking, symbols of the mighty steel industry, make possible advances like continuous wide strip galvanizing.

Working side by side to achieve the results, are the specialists of the industry and the equipment manufacturers like The Aetna-Standard Engineering Company.

Reprint from The Pittsburgh Sun-Telegraph

THE AETNA-STANDARD ENGINEERING COMPANY

YOUNGSTOWN, OHIO

ASSOCIATED COMPANIES:

HEAD, WRIGHTSON & COMPANY, LTD., THORNABY-ON-TEES, ENGLAND

AETNA-STANDARD ENGINEERING COMPANY, LTD., TORONTO, ONTARIO, CANADA

Five Allegheny Ludlum Men Win Medals, Cash For Development Work

Pittsburgh

• • • Awards have been presented to five Allegheny Ludlum Steel Corp. employees for development work on stainless and alloy steels. They received the president's medal, a citation from the board of directors and a cash award. Three of them received \$1000 each while two shared a \$1000 award.

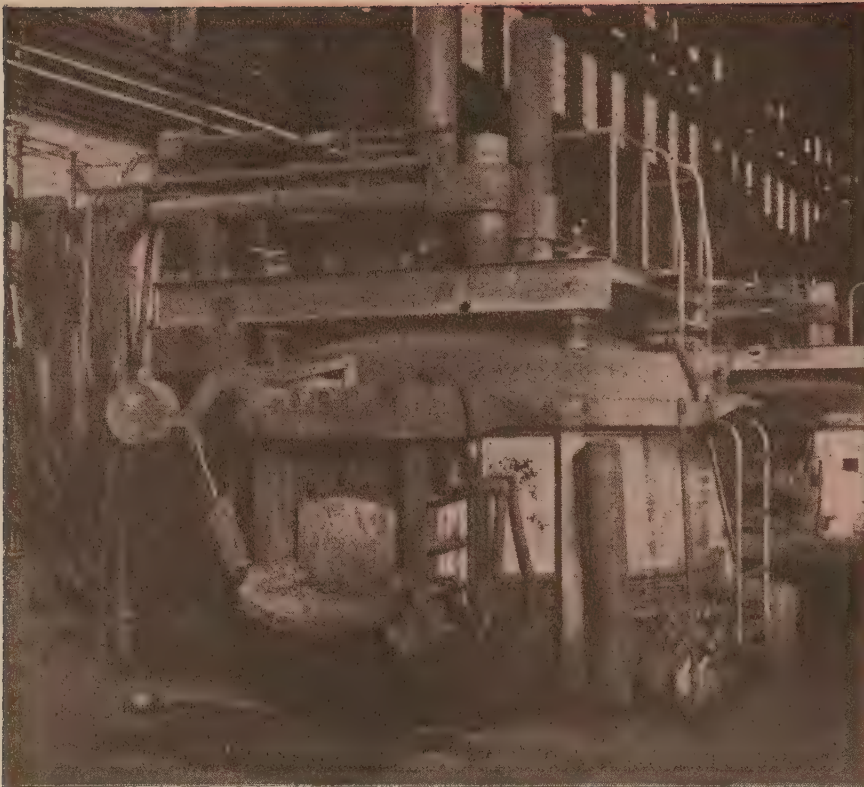
The recipients were: Karl Elers, assistant manager of sales, Chicago district; Arthur H. Hanks, manager of wire departments, Dunkirk, N. Y., plants, and Louis Zaccagnini, melter in the electric furnace department of the Watervliet, N. Y., plant. An award was shared by John H. Crede, associate director of research—magnetic materials, and Jack P. Martin, metallurgist, magnetic materials section, research laboratory, both of Brackenridge, Pa.

Mr. Elers won his award for his efforts in laying the groundwork and developing arrangements which resulted in the use by the U. S. Corps of Engineers of a very substantial tonnage of stainless steel wire mats for the Mississippi River Flood Control program. Forty-two years old, Mr. Elers has been with the company for 19 years.

Improved production techniques for stainless steel wire were the basis of the award granted to Mr. Hanks. Processes he developed have opened new markets for stainless wire products. Mr. Hanks, 47, has been employed at the Dunkirk plant for 26 years.

Mr. Zaccagnini's award was made because of the work he has accomplished in increasing the yield from stainless and other high alloy steel ingots. Mr. Zaccagnini, at 55, is a veteran of 34 years in the Watervliet melting department.

The award to Messrs. Crede and Martin resulted from their work in developing commercial processes for the manufacture of Allegheny Deltamax, a new magnetic core material. Mr. Crede, 36, has been with the company for 14 years, and Mr. Martin, 29, joined the Brackenridge research department in 1946.



Filling a large number of small, diversified orders profitably is one of the outstanding services offered by Moore Rapid Lectromelt Furnaces. The usual heat melted by the Lectromelt Furnace can have its analysis repeatedly changed, if desired, quickly and easily. Thus you can tap the heat to fill one order, alter the analysis, tap for another order and repeat this process until all the metal has been used. That turns small orders into profit.

Lectromelt Furnaces are available in capacities ranging from 250 pounds to 100 tons. Write today for complete information.

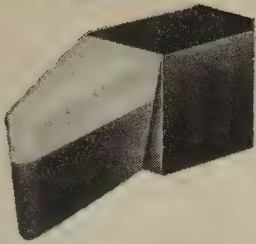
PITTSBURGH LECTROMELT FURNACE CORP.

PITTSBURGH 30, PA.

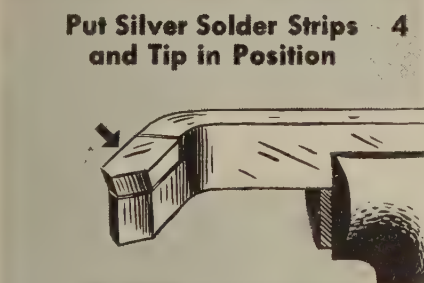
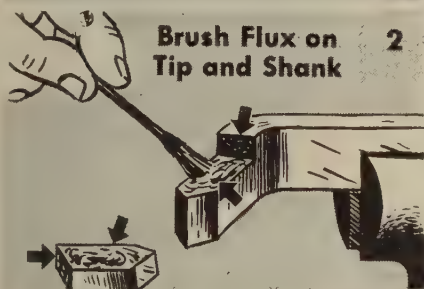
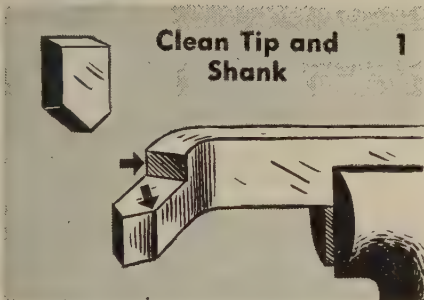
manufactured in: CANADA, Lectromelt Furnaces of Canada, Ltd., Toronto 2; ENGLAND, Birlec, Ltd., Birmingham; SWEDEN, Birlec Elektkougner A/B, Stockholm; AUSTRALIA, Birlec Ltd., Sydney; FRANCE, Stein et Roubaix, Paris; BELGIUM, S. A. Belge Stein et Roubaix, Bressoux-Liege; SPAIN, General Electrica Española, Bilbao; ITALY, Forni Stein, Genoa.



HOW TO MAKE YOUR OWN TIPPED CUTTING TOOLS



The sketches below show how easy it is to make your own tools by silver brazing HAYNES STELLITE tool tips to steel shanks. There are 14 standard shapes of these tips stocked for immediate delivery. Write for a copy of "HAYNES STELLITE Metal Cutting Tools" which illustrates the sizes and types of tool tips available (use the convenient coupon below). You will find prices considerably lower than for solid or welded tip tools.



1. Clean both the tip and the recessed area of the steel shank by light grinding if necessary—then brush with carbon tetrachloride. Clamp shank in vise with bottom surface of recess level.

2. Brush silver-brazing flux generously onto the joint surfaces of both tip and shank.

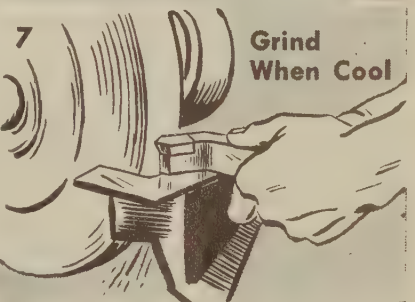
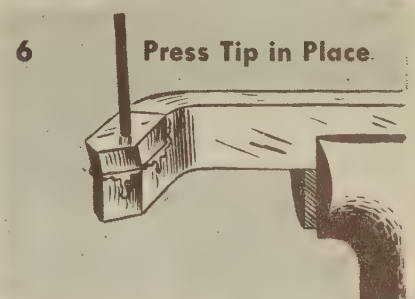
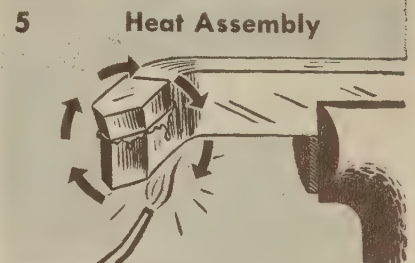
3. From 0.003-in. thick silver solder strip cut pieces slightly over-size for the joint faces of the recess.

4. Position the brazing alloy strips and place the fluxed tip in the shank recess ready for heating.

5. Use an oxy-acetylene blowpipe with a reasonably large tip and adjust for a reducing flame. Heat the shank underneath the tip to a cherry red, rotating the flame from bottom to side to top to other side to bottom. (For large quantities of tools, you can do this heating in a furnace at approximately 1450 deg. F.)

6. When the silver alloy melts, move the tip with a rod or tongs into exact position, and then press it just enough to squeeze out excess flux and silver solder. Allow the assembly to air-cool. *Do not quench!*

7. When the assembly is completely cool, remove the excess flux and scale. The tool is now ready for grinding.



**WRITE FOR
YOUR
FREE COPY
TODAY**

HAYNES
TRADE-MARK
Alloys

Haynes Stellite Company
Unit of Union Carbide and Carbon Corporation



The registered trade-marks "Haynes" and "Haynes Stellite" distinguish products of Haynes Stellite Company.

**USE THIS
HANDY
COUPON**

Haynes Stellite Company, 729 S. Lindsay Street, Kokomo, Ind.

Please send me, without obligation, your booklet, "HAYNES STELLITE Metal-Cutting Tools."

NAME _____

COMPANY _____

ADDRESS _____

Claims Power Output Increased 80 Pct With Supercharged Engine

Mt. Vernon, Ohio

• • • Successful development of a supercharged 4-cycle gas engine, claimed to increase power output by 80 pct while cutting fuel consumption by one-third, has been announced by Cooper-Bessemer Corp., Mt. Vernon, Ohio, and Grove City, Pa.

Previously the highest efficiencies from gas fuel were obtained with dual fuel (gas-diesel) engines, which necessitate consumption of oil as a pilot fuel—a requirement tolerated in many installations solely for the sake of high efficiency rather than the conversion feature. Without need for any pilot fuel whatever, the Cooper-Bessemer 4-cycle, spark-ignited gas engine attains efficiencies equal to or exceeding the best performance of gas-diesels, company officials stated.

According to R. L. Boyer, Cooper-Bessemer vice-president and chief engineer, successful development of the engine was aided materially by new principles worked out by Cooper-Bessemer while perfecting their now-famous Turboflow gas engines of 2-cycle design.

"For example," Mr. Boyer said, "our findings that permitted a more intimate mixture of gas and air, combined with our unique principle of Turboflow ignition, opened the way to the supercharging of this 4-cycle engine. It is the successful application of supercharging, of course, that is largely responsible for the engine's remarkable performance."

"We are able to report on the power and fuel economy features of the new engine with complete certainty," he continued, "because it has completed all tests with entire satisfaction. Where conventional spark-ignited gas engines operate on a fuel input of 9500 to 10,000 Btu per hp-hr, the new engine requires less than 7000 Btu. And, by achieving an increase in brake-mean-effective pressure from the normal 70 lb to 125 lb psi, our new engine is able, therefore, to produce an 80 pct power increase over ordinary gas engines with the same piston displacement."

This not only means unprecedented reductions in over-all operating cost, but very substantial savings

specify
FOLLANSBEE
for
QUALITY
ELECTRICAL SHEETS

There's a Follansbee Electrical Sheet with the proper physical and electrical characteristics for any design requirement.

When you specify Follansbee you can be sure of silicon steel suitable for use in the manufacture of your high quality electrical machinery. Follansbee Electrical Sheets are now available for use in your products.

You'll be interested to know about the working qualities of Follansbee Electrical Sheets, too. The Follansbee Representative will assist you in selecting the correct grade for your specific requirements.

FOLLANSBEE STEEL CORPORATION

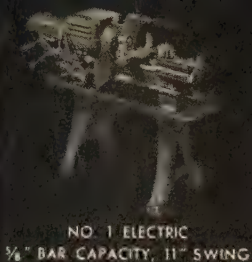
GENERAL OFFICES, PITTSBURGH 30, PA.

COLD ROLLED STRIP • ELECTRICAL SHEETS • POLISHED BLUE SHEETS
SEAMLESS TERNE ROLL ROOFING

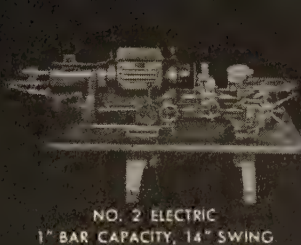
Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee. Sales Agents—Chicago, Indianapolis, St. Louis, Kansas City, Nashville, Houston, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada.

Plants—Follansbee, W. Va., and Toronto, Ohio.
Follansbee Metal Warehouses—Pittsburgh, Pa.,
Rochester, N. Y., and Fairfield, Conn.





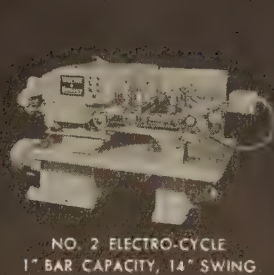
NO. 1 ELECTRIC
3/4" BAR CAPACITY, 11" SWING



NO. 2 ELECTRIC
1" BAR CAPACITY, 14" SWING



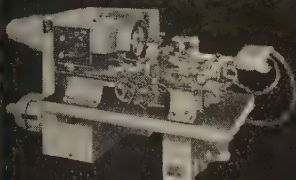
NO. 2 ALL GEARED HEAD
1" BAR CAPACITY, 14" SWING



NO. 2 ELECTRO-CYCLE
1" BAR CAPACITY, 14" SWING



NO. 3 UNIVERSAL
1 1/2" BAR CAPACITY, 15 3/4" SWING



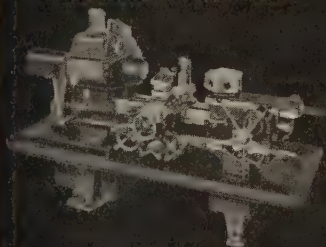
NO. 3 ELECTRO-CYCLE
1 1/2" BAR CAPACITY, 15 3/4" SWING



16" ELECTRO-CYCLE
1 1/2" BAR CAPACITY, 16 3/4" SWING



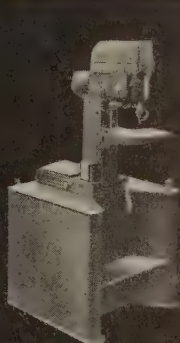
NO. 4 UNIVERSAL
2" BAR CAPACITY, 18 1/4" SWING



NO. 5 UNIVERSAL
2 1/2" BAR CAPACITY, 20" SWING



1-A SINGLE SPINDLE AUTOMATIC CHUCKING
MACHINE, 8" OR 10" CHUCK, 6" TURNING LENGTH



NO. 10 TAPPING MACHINE
CAPACITY 0.80 TO 10-24



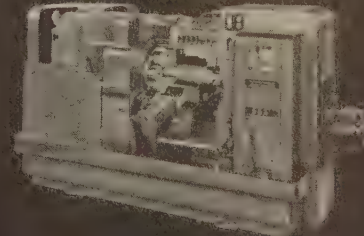
NO. 11 TAPPING MACHINE
CAPACITY 8-36 TO 7/8"



NO. 12 TAPPING MACHINE
CAPACITY 3/8" TO 2 1/2"



5-SPINDLE AUTOMATIC BAR MACHINES
1 3/4" STANDARD BAR CAPACITY
2 1/4" OVERSIZE CAPACITY



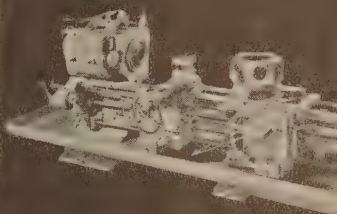
5-SPINDLE AUTOMATIC CHUCKING MACHINE
6" SWING



1-A UNIVERSAL HEAVY DUTY
3 1/2" OR 2" BAR CAPACITY, 14 1/2" SWING



2-A UNIVERSAL HEAVY DUTY
3 1/2" BAR CAPACITY, 20" SWING



3-A UNIVERSAL HEAVY DUTY
4 1/2" OR 6" BAR CAPACITY, 23 1/2" SWING



4-A UNIVERSAL HEAVY DUTY
8", 9" OR 12" BAR CAPACITY, 28 1/4" SWING

Warner & Swasey *Sells one thing...*

INCREASED PRODUCTION

● When you buy a Warner & Swasey, you buy increased production—greater output at lower cost.

The power, rigidity, accuracy, and ease of operation built into each Warner & Swasey all add up to a greater return on your investment.

*You can machine it better, faster, for less
...with a Warner & Swasey*

TURRET LATHES, MULTIPLE & SINGLE SPINDLE AUTOMATICS, PRECISION TAPPING AND THREADING MACHINES

**WARNER
&
SWASEY**
Machine Tools
Cleveland

WHY WASTE FUEL?



Therm-O-flake *prevents waste* **BY REDUCING HEAT LOSSES...**

MORE THAN 25% of Open Hearth fuel can be wasted through heat lost through brickwork and heat absorbed by cold infiltrated air.

Therm-O-flake INSULATIONS are designed to reduce heat losses and seal furnace walls against cold air infiltration. These are used regularly on hundreds of open hearth furnaces and save steel producers thousands of fuel dollars daily.

Therm-O-flake ENGINEERS will prepare an accurate fuel economy survey of existing furnaces in your plant and submit complete thermal data and recommendations for safe maximum insulation of any open hearth furnace, on request.



JOLIET, ILLINOIS

Exclusive Manufacturers of

Therm-O-flake open hearth Insulation

in the cost of engine installation, he pointed out. Power needs now can be met with fewer or smaller engines, in less space, cutting down on the cost of foundations and buildings.

Likewise of significance to power engineers is the fact that the new-type engine requires no increase in cooling equipment. It is claimed that the total heat developed is no greater than with the old-style engines, despite the great increase in power. In turn, this amounts to a further big saving in the cost and maintenance of piping as related to power needs.

Cooper-Bessemer believes that its supercharged gas engine will tend to expand the already widespread use of spark-ignited gas engines, notably in municipal, REA and industrial power plants, oil field operations, sewage treatment plants and among the smaller stations of the electric utilities.

"It is almost certain that this will be felt immediately in areas where gas is now plentiful," said Gordon Lefebvre, president, "and since engines burning gas as their sole fuel can now be operated at such high efficiencies, it is entirely possible that this development will further the expansion of gas lines into sections more remote from gas producing fields.

"The possibility of interrupted gas supply in areas still subject to emergency curtailment will be little handicap to the broad acceptance of the new engine," Mr. Lefebvre continued. "This new design can be easily and very quickly converted to either gas-diesel or full oil-burning diesel operation. In fact, we have already made test conversions in from 1 to 2 hr."

Cooper-Bessemer plans call for building the new-type engines in various sizes, with regular production scheduled to get under way between now and year-end, according to Mr. Lefebvre.

Pittsburgh Activity Dips

Pittsburgh

• • • Business activity here dipped to its lowest level since March, according to the Bureau of Business Research of the University of Pittsburgh. The March low was caused by the coal strike. The index for the week ended May 17 stood at 185.5 pct of the 1935-1939 average.

Harvester Executive Expects No General Price Reductions Now

Chicago

• • • J. L. McCaffrey, president, International Harvester Co., told the annual meeting of stockholders recently that the last 12-month period represented the high tide of International Harvester business but overall he expected the next fiscal year to be a good one. The first 6 months of Harvester's 1949 fiscal year (Nov. 1, 1948, to Apr. 30, 1949) the company's physical production and dollar sales reached the highest levels for the period in the company's history. Total sales for this period were approximately \$482,774,000 as compared with \$433,889,000 in the same period of 1948.

Mr. McCaffrey said, "The improved net income resulted largely from three factors—increased volume of our sales, the consequent lower overhead cost per unit, selling prices in better relation to costs in the first half of 1948 and generally greater efficiency and economy in operations throughout the company."

The president reported that the first 6 months of the 1949 fiscal year total dollar sales were about 11 pct greater than in the corresponding period of last year. He added, "It is probably significant that in April, for the first time, our monthly sales were below the sales for the corresponding month of 1948. It is also interesting to note that this is the first time in 33 months the sales for a given month have been less than for the corresponding month of the previous year."

McCaffrey touched on the fact that inventories are now normal and that there has been an end of forward buying by customers and they have returned to the old custom of taking goods at the season of expected use. "In all lines of our business the customer has resumed his normal control over the market as to goods sold, as to goods produced, and increasingly over prices."

The Harvester executive said that he saw little hope of a reduction in the cost of producing and distributing goods in the near future. What reductions might be made, he said, did not appear large

Let's talk shop—



Here's what I hear from the boys who know **Firth Sterling** high speed toolholder bits—

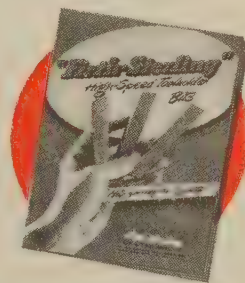
They go for **CIRCLE C** in a big way! It's the top quality tool bit steel! *But its cost is negligible.* By increasing production even 5%—the resulting man and machine earnings completely eliminate the tool bit cost. And, it cuts materials many other high speed steels can't touch. You can't beat **CIRCLE C**.

There may be applications in your shop where Firth Sterling **BLUE-CHIP** (an 18-4-1 machining stand-by for many years) will do the work most economically and satisfactorily and where the top quality Circle C is not required. Or, if you want a still more moderately priced general purpose bit, Firth Sterling **STAR-MO M-2** can fill the bill.

Whichever grade you require—if it's Firth Sterling, it's the best for your job.

Bulletin SL-2028 gives you the details on all Firth Sterling High Speed Toolholder Bits—write today for a copy.

Better yet, call your nearest Firth Sterling office for a Representative who can help you choose the right high speed toolholder bit for your particular job.



Firth Sterling

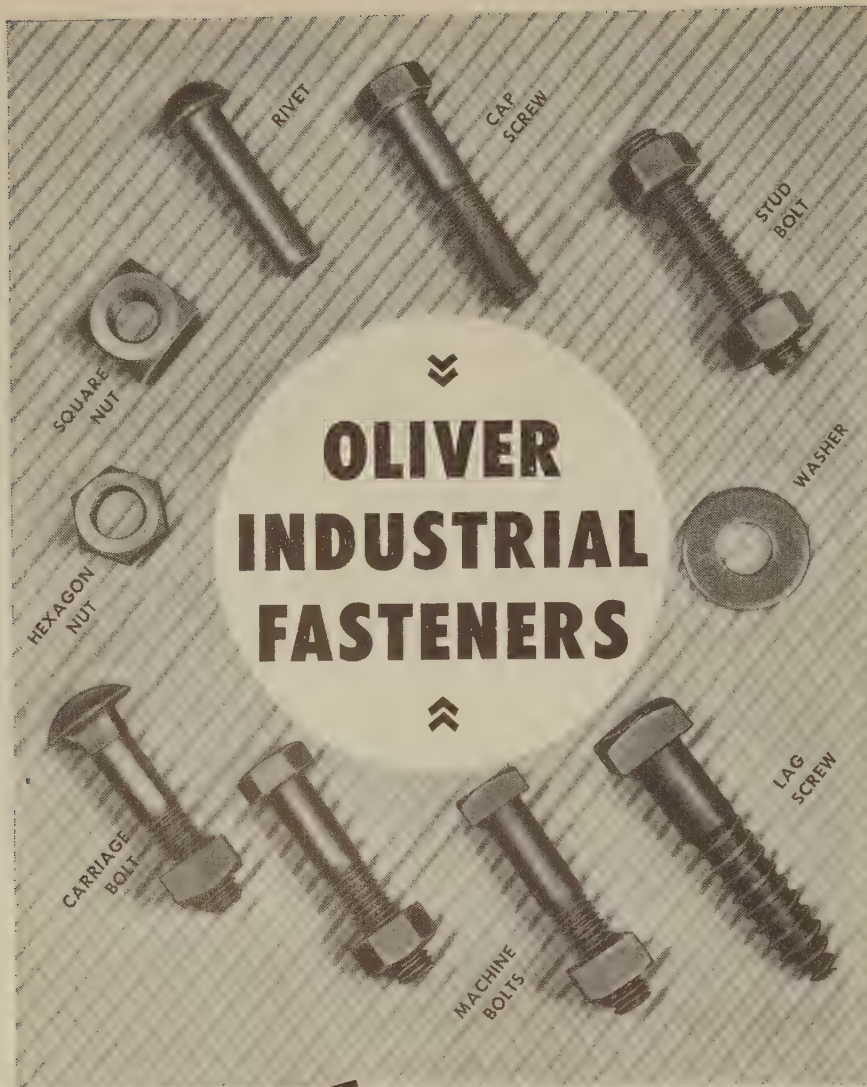
STEEL & CARBIDE CORPORATION

McKEESPORT, PA.

Offices and Warehouses in Hartford, Philadelphia, Cleveland, Detroit, Chicago, Dayton and Los Angeles. Offices in New York and Pittsburgh.

Distributors: Carey Machinery & Supply Company, Baltimore—York Machinery & Supply Company, York, Pa.—Tanner and Company, Indianapolis—Wm. S. Bolden Co., Charleston—Huge-Fayle Company, Houston

In Canada: Chapat Engineering & Sales, Ltd., Hamilton, Ontario



THEY FIT

because they are accurately made

SPEED PRODUCTION

because they are uniform

SATISFY YOU

because they are highest quality

Made in all commercial sizes and types, Oliver Industrial Fasteners are dependably uniform in size, accurately formed and cleanly threaded. Oliver is one of the oldest and largest makers of fasteners, with a broad background of experience in the design, application and manufacture of standard and special types.

Insist on OLIVER Industrial Fasteners—to insure complete satisfaction!

See your distributor

OLIVER
IRON AND STEEL
Corporation

South Tenth and Muriel Sts. • Pittsburgh 3, Pa.

enough to justify any general price reduction. He continued, "When general price levels are considered, however, it is clear that of the four principal elements of cost—labor, taxes, materials and transportation—only material costs are trending downward."

Dwelling Orders Hit Machine Tool Builders

Boston

• • • Virtually all machine tool builders are operating with fewer employees than on Jan. 1, due to dwindling orders. To date, however, layoffs have not been drastic. They may appear fairly so in June and July, because in those months a few manufacturers plan to close for vacations.

With metalworking industries curtailing new construction and plant improvements, the tendency is to make those machine tools on hand do for the time, at least. A feeling persists among the rank and file of tool builders that things will be better in the last half of 1949. Some are willing to go on record that export business is sure to be improved. At the moment, however, sentiment is kind of glum.

Hook Honored at Dinner

Middletown, Ohio

• • • Charles R. Hook, internationally known industrialist and chairman, Armco Steel Corp., was honored recently at a "recognition dinner" at the Manchester Hotel, Middletown. He was presented a testimonial book bearing the signatures of more than 15,000 of his friends and neighbors, who also contributed pennies, nickels and dimes to buy a bronze plaque as a permanent expression of appreciation on his 50th anniversary in the steel industry.

Military authorities honored Mr. Hook at the dinner for his work as chairman of a national advisory commission on armed services pay.

High ranking officers of the Armed Services presented Mr. Hook the "Award of the National Military Establishment," instituted upon the recommendation of former Secretary of Defense, James Forrestal, and being carried out by the new secretary, Louis Johnson.

Coal Production Ranks As Essential Factor In European Recovery

Washington

• • • Increased production of coal in Europe, a key factor in economic recovery, still ranks among the important problems faced by Marshall Plan countries despite recent improvements, according to Economic Cooperation Administration.

As the second year of the European Recovery Program gets under way, the most essential of the European industries and services have a sufficient supply of coal for basic operations, but ECA allocations still are necessary to relieve shortages in other industries and to meet a demand for fuel which will increase as Europe's industrial output expands.

The acute shortage existing after the war was one of the principal deterrents to recovery. Supplies of the proper quality of coal were insufficient for the steel and other essential industries and for heating workers' homes. The shortage, resulting in higher prices for coal and, in turn, higher prices for manufactured goods, contributed to general inflation.

At the close of the first year of the recovery program, the shortage of coal had eased, as far as essential industry was concerned, because of a rise in production within Europe, diversion of supplies to industry from other consumers, and an increase in the use of petroleum fuels, supplemented by ECA financed imports.

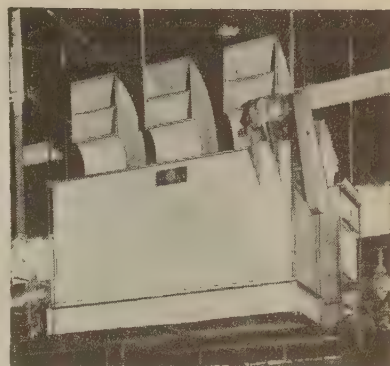
The recovery program goals for the coming year are to obtain greater supplies of coal from participating country sources and to improve the efficiency and economy of production and distribution so as to provide the required qualities of coal at reasonable prices.

Progress of European coal production is shown by the cut in requirements for American coal imports in 1948 to about 50 pct of the 1947 requirements. Requirements in 1948 were 18 million tons, and in 1947 they were 37 million tons. In the fiscal year 1948-49, requirements will be reduced to an estimated 16 million tons, and in fiscal 1949-50, to an estimated 10 million tons.

Measured in terms of European

New HIGH PRESSURE STEAM Fan Heater Gives Savings You Never Had Before

The first heater to make High Pressure Steam really trouble-free and practical in plant heating. Every engineer should understand its original method; write for Niagara Bulletin and performance data.



HOW IT OPERATES: — A dual coil system makes use of all heat, both sensible and latent. High pressure steam enters the upper coil, shown on the diagram below. Its condensate drains into a trap. Then this high pressure condensate is released into the header of the lower coil. It instantly flashes into steam at vapor pressure.

Any high pressure condensate that remains liquid is carried to the vapor condensate return header by a drain tube that also gives off its heat into the air stream.

The vapor condenses in the lower coil. Its condensate is kept at a high level in the return leg by a wiper in the return header so that all its heat is made useful and it is sub-cooled by contact with the coldest air entering the heater. Vacuum condensate return to boiler is vapor-free.

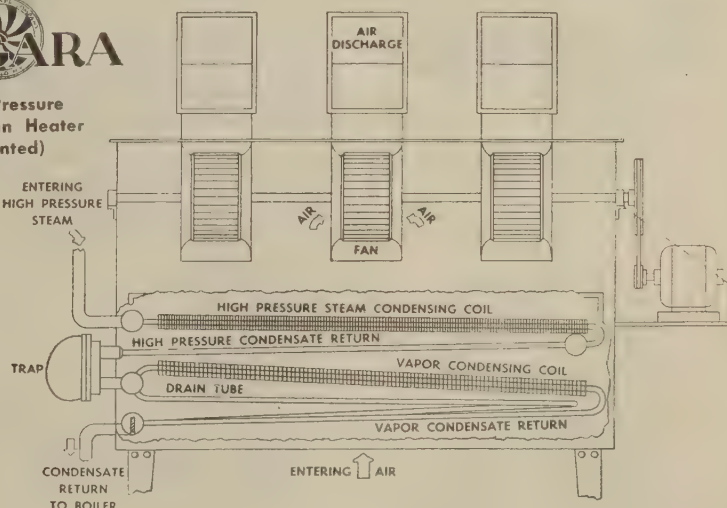
HOW IT SAVES IN COST: — Piping is much simpler and less costly than in low pressure systems. Much secondary piping, traps and big valves are not needed. Pipe sizes are smaller.

HOW IT SAVES IN OPERATION: — Waste is prevented. Every BTU goes where you want it. No dump traps or hot wells waste live steam.

HOW IT SAVES IN UPKEEP: — Condensate flow is even, vapor free, easily handled. No sudden surges of condensate in starting. No hammering, no hard wear and tear on system. Properly engineered for the job, final air temperatures are not excessive; heat easily directed where needed; no flashing of low pressure condensate. Heaters are self-draining on shut-down. Heaters are strongly built; all coils including the condensate drain tubes are hairpin bend, stress relieving. Use thru four heating seasons has proven these advantages in large scale plant heating.



High Pressure
Steam Fan Heater
(Patented)



NIAGARA BLOWER COMPANY

Dept. 1A, 405 LEXINGTON AVE., NEW YORK 17, N. Y.

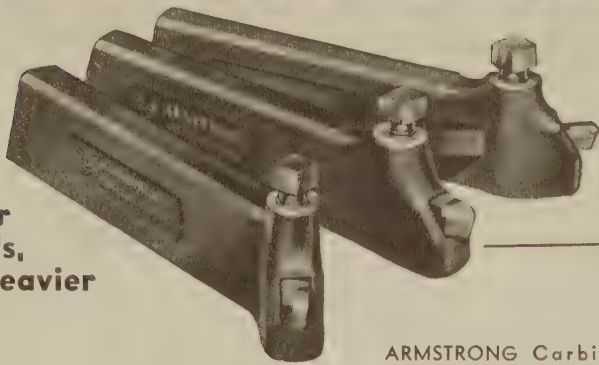
Please send Bulletin 109 on the Niagara High Pressure Steam Fan Heater.

Name

Address

ARMSTRONG *Carbide* TOOL HOLDERS

**For
Higher
Speeds,
and Heavier
Feeds**



ARMSTRONG Carbide Tool Holders and ARMIDE (Carbide

Tipped) Cutters come in cased sets for tool rooms and maintenance departments, and individually in all sizes for general machine shop and production turning. They permit not only the ready machining of sand-filled castings, the hardest and toughest steels as well as many heretofore "unmachineable" materials, but also make practical much heavier cuts and cutting speeds up to 600 f.p.m. on ordinary work. They also run from 10 to 100 times as long between regrindings.

Write for NEW S-48 Catalog just released.

ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

5209 WEST ARMSTRONG AVE., CHICAGO 30, ILLINOIS
NEW YORK SAN FRANCISCO



For those WHO BUY OR SPECIFY
SPECIAL BOLTS • STUDS • NUTS

ERIE

**OFFERS THIS
HANDY DATA**

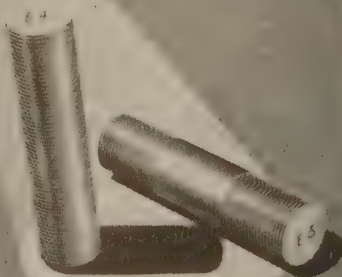
and
**PRICE
BOOK**
on

**PRECISION
QUALITY
BOLTING**

Write for copy

ERIE BOLT & NUT CO.
ERIE, PA.

Barium



No. 440

ERIE BOLT & NUT CO.

ERIE, PA.

STUDS • BOLTS • NUTS ~ ~ ~ ALLOYS • STAINLESS • CARBON • BRONZE

REPRESENTATION IN PRINCIPAL CITIES

A SUBSIDIARY OF
Barium
STEEL CORPORATION
Steelmasters to the Nation

NEWS OF INDUSTRY

production, output of hard coal in the ERP countries in 1946 was 338 million tons. It rose to 368 million tons in 1947 and 398 million in 1948, but in the latter year it was still 61 million tons below the average annual production of 459 million tons in the 1935-38 period.

Belgium and France already are either above or close to pre-war rates of production. Bizone Germany, during the next fiscal year, is expected to produce about 18 million tons more than the present year, and the United Kingdom about 12 million tons more. During fiscal 1950, the annual rate of coal production is expected to reach 442 million tons, or 44 million tons higher than the 1948 rate and only 18 million tons under the 1935-38 average.

Improvements in coal production have been gained by adding manpower, increasing food supplies, making more consumer goods available and in general restoring more stable economic conditions. Top priorities were given to the coal mining industry for procurement of equipment, machinery and supplies.

Improvements in the future will depend very much on securing greater production efficiency through rehabilitation of mines and equipment and in solving problems holding down worker productivity. These latter include absenteeism, rapid labor turnover, poor housing for miners, the high average age of workers and other production obstacles resulting from the war. Such problems must be solved to increase the output per man-shift, which remains below pre-war levels.

In December 1948, the output per man-shift was approximately 96 pct of the pre-war (1935-38) average in Great Britain, approximately 80 pct in France, The Netherlands and Belgium, but in Western Germany it was only 62 pct of the 1935-38 average. Increases from December 1947 to December 1948 ranged from 2 to almost 11 pct: 2 pct in Great Britain, 4 pct in Belgium, 8 pct in The Netherlands, 10 pct in Germany and approximately 11 pct in France.

All participating countries have prepared rehabilitation programs designed mainly to improve efficiency and reduce costs of production. Total investments for a

4-year period—to originate mostly from local sources and partly from ECA funds—will amount to the equivalent of more than \$2 billion. This investment is expected to result in production increases of 143 million tons of hard coal and 23 million tons of brown coal and lignite annually by the end of 1953, using 1947 as the base year. At this level, hard coal production would be 511 million tons, or 52 million tons above the annual average of 1935-38.

ECA, during the first 11 months of its operations, authorized \$228.9 million of coal and related fuels, exclusive of ocean freight charges, for European recovery. Most of this total authorization went to France and Italy, France receiving \$130.2 million and Italy, \$55.3 million. Austria was third highest on the list with \$22.3 million. Other countries received negligible amounts.

More than 60 pct of all coal and related fuels authorized thus far originates in the United States which is supplying \$143 million of the \$228.9 million total authorizations. Most of the remainder was authorized in the early part of the program in the participating countries which accounted for \$75.8 million. Dollars are no longer used for financing purchases in ERP countries now that the Intra-European Payments Agreement is in operation.

Will Salvage Plant Residue

New York

• • • Millions of dollars worth of zinc, in a pile of metal-bearing plant residue at Flin Flon, a mining town in northern Manitoba, Canada, will be salvaged with the help of specially designed equipment which is now being built, according to officials of The Babcock & Wilcox Co. The equipment will be used by the Hudson Bay Mining & Smelting Co., Ltd., in connection with the fuming process for treating reverberatory slag which contains zinc from copper concentrates and zinc plant residue.

The zinc residue from the zinc leaching plant, containing amounts of zinc, copper, cadmium, gold, and silver, has been continuously stockpiled by the company since 1930 and is now estimated to total nearly 800,00 tons.

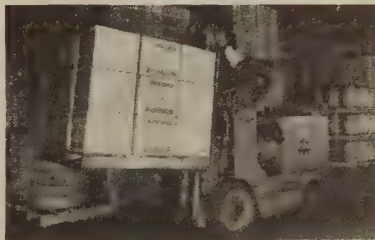
**Warehouse handling
3,832,939 lbs. of stores
per month uses
*BAKER TRUCKS***

**STOCK COMPRISES
3700 DIFFERENT ITEMS —**

Some in Barrels



Some in Cartons



Some in Crates



Some in Reels



Take a look at these figures:

This utility company warehouse has a total storage space of 177,220 sq. ft.—all but 25,000 sq. ft. under roof. An average of 3,832,939 lbs. of stores are handled per month—comprising 3700 different items, including pole line hardware, wire, transformers, etc.—with average stock value of \$1,051,984.00. Deliveries in unit loads from general storeroom to 38 outlying stores average 1,014,000 lbs. per month.

To facilitate this handling job, the company uses 2 Baker Trucks. One, an old platform truck still giving daily service, is 23 years old. The other, a 4000 lb. Fork Truck (illustrated), was purchased more recently. It is saving time and cutting costs in loading, unloading and high-tiering.

If your handling problem is large or small, complicated or simple, a Baker Material Handling Engineer can help you.

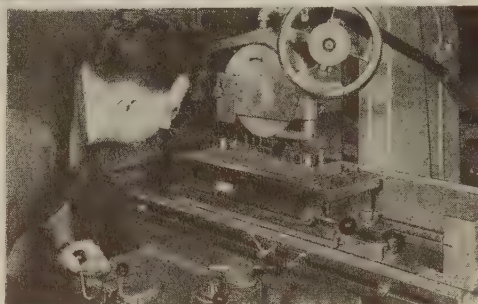
BAKER INDUSTRIAL TRUCK DIVISION
of The Baker-Raulang Co.

1227 West 80th St., Cleveland 2, Ohio
In Canada: Railway & Power Engineering Corporation, Ltd.

Baker INDUSTRIAL TRUCKS

Enthusiastic Customers do our BEST advertising

Tinnerman Products, Inc. of Cleveland, Ohio, manufacturers of Speed Nuts, use a No. 25 Grand Rapids Hydraulic Feed Surface Grinder in their tool room. Here their Model 25 is shown grinding a combination die.



You will appreciate the micro-inch finish produced at production speeds on Grand Rapids Grinders. All Grand Rapids Hydraulic Feed Surface Grinders have these outstanding features:

1. One-piece column and base casting for vibrationless rigidity
2. Precision ball-bearing spindle which is greased for life
3. Bijur one-shot lubrication system eliminating hand oiling
4. Patented vertical movement of wheel head for quick, accurate adjustments
5. Portable coolant tank for ease of coolant replacement
6. Vane type hydraulic pump for fast longitudinal table travel

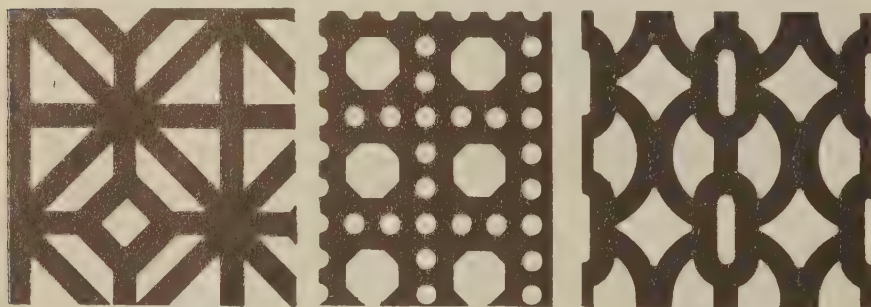
To serve you—

Your inquiry concerning your specific grinding needs will receive prompt attention. Grand Rapids Grinders include: Hydraulic Feed Surface Grinders, Universal Cutter and Tool Grinders, Hand Feed Surface Grinders, Drill Grinders, Tap Grinders, and Combination Tap and Drill Grinders.



200 Straight, S. W., Grand Rapids 4, Mich.

GRAND RAPIDS GRINDERS



Ornamental perforated metal

Hendrick offers a wide variety of decorative patterns in light weight, perforated metal, for radiator enclosures, stove panels, kitchen cabinets, and similar applications.

Regularly furnished in steel sheets of available stock size, in gauges from 16 to 22. These patterns can also be supplied in other metals on special order. Write for full information.



Perforated Metals
Perforated Metal Screens
Architectural Grilles
Mitco Open Steel Flooring,
"Shur-Site" Treads and
Armorgrids

HENDRICK

Manufacturing Company

37 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

Japanese Aluminum Industry Described In BM Publication

Washington

••• Rapid adaptation of modern industrial methods, cheap electric power, and a well-organized transportation system were the major factors responsible for Japan's dramatic rise to fourth ranking world producer of aluminum during World War II, according to a publication recently released by the Bureau of Mines describing aluminum production in the former Japanese empire.

As late as 1933, Japan imported her entire requirements of aluminum, the publication points out. After a decade of continuous industrial expansion to meet growing military requirements, Japanese processing plants were producing about 150,000 tons of primary metal by 1943. The collapse of Japan in August 1945, halted all aluminum production. At present, only 10,000 tons of secondary aluminum are being recovered annually from scrap and various alloys.

The publication was prepared by Glen L. Allen and Virgil Muller, Bureau metallurgists and former scientific consultants in the Natural Resources Section, GHQ, Supreme Commander for the Allied Powers, Tokyo.

A free copy of Information Circular 7496, "The Japanese Aluminum Industry," may be obtained from the Bureau of Mines, Publications Section, 4800 Forbes St., Pittsburgh 13, Pa.

Awarded McFadden Medal

Detroit

••• The William H. McFadden Gold Medal for contributions to the foundry industry has been awarded to Costa Vennerholm, supervisor of Ford Motor Co.'s metallurgical research section of the process engineering laboratory.

Vennerholm has been associated with Ford Motor since 1924. He has been actively associated with American Foundryman's Assn., American Society for Metals, SAE, and the War Engineering Board.

Vennerholm is the twelfth recipient of the William H. McFadden Gold Medal.

Warns Business That Profits Increasing In Economic Importance

Milwaukee

••• **Danger** signals are flashing for American business, according to James D. Mooney, board chairman of Willys-Overland Motors.

While profits are declining in size they are increasing in economic importance, Mooney declared at the annual meeting of the Wisconsin Manufacturers Assn.

He pointed out that corporate profits in the first half of 1948 amounted to only 7.2 pct of the national income, compared with 8 pct in 1940 and 10.3 pct in 1929. Yet industry must now depend more heavily on its own earnings for capital funds, Mooney added.

Corporations had to provide for 65 pct of their capital funds out of their own earnings in 1948 compared with the 53 pct of previous years, he said.

"To meet the needs of a growing population, business must expand. An increasing share of this expansion must be paid for out of earnings. Yet there is a sentiment to increase the tax burden on corporate earnings.

"It is high time for our country to take a good long look at the function of profits in our economic system," Mooney declared.

"The basic social function of profits is to govern the amounts and types of goods that are produced. If we freeze profits at any arbitrary level by indiscriminate taxes, we throw our whole production-distribution system out of balance."

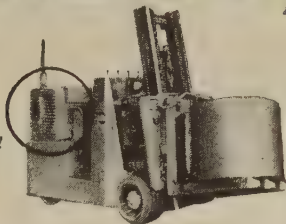
Mooney warned that conventional accounting practices give inadequate business information. As one example he pointed to the problem of inventory valuation in a period of rapid fluctuation in prices.

Depreciation rates offer another critical problem, Mooney declared. "Under present tax laws corporations can only deduct depreciation on the basis of original investment. But a plant that cost \$2 million to build some time ago would now cost \$4 million to be replaced," Mooney said.

"Obviously we must make a further provision beyond the conventional accounting method if we are

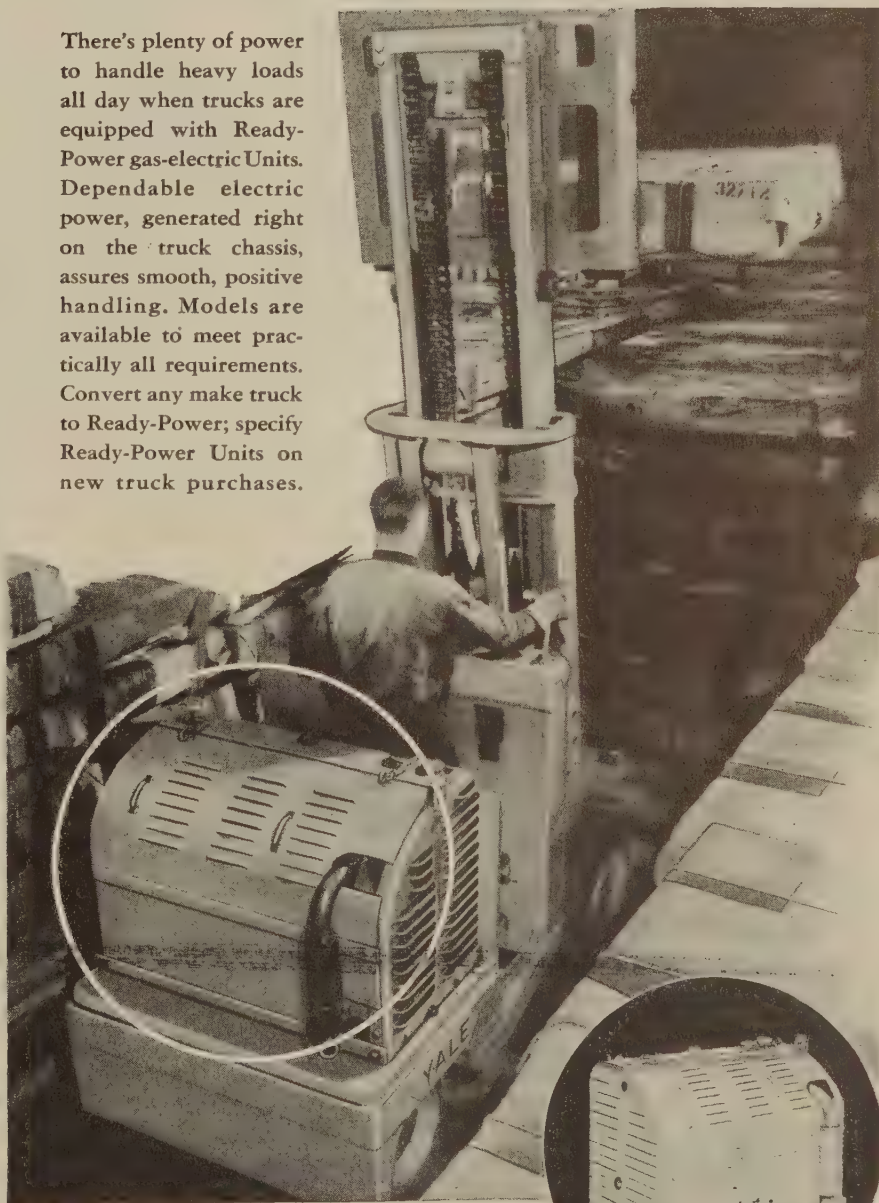
heavy loads need

Ready-Power-equipped Baker truck



READY-POWER

There's plenty of power to handle heavy loads all day when trucks are equipped with Ready-Power gas-electric Units. Dependable electric power, generated right on the truck chassis, assures smooth, positive handling. Models are available to meet practically all requirements. Convert any make truck to Ready-Power; specify Ready-Power Units on new truck purchases.

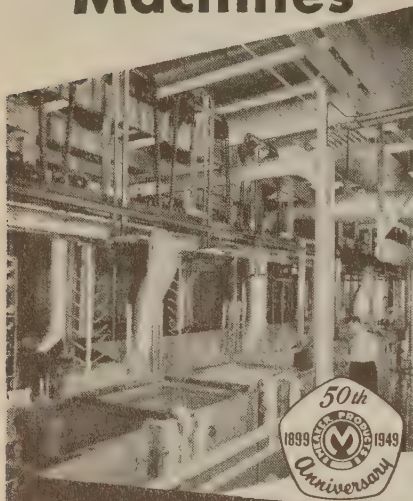


THE **READY-POWER** CO.

3822 Grand River Ave., Detroit 8, Michigan

MEAKER

Electroplating Machines



AUTOMATIC MACHINES
STRAIGHT-A-WAY and RETURN TYPE
for mass production of
large or small pieces

SEMI-AUTOMATIC MACHINES
For supplementary capacity
or medium output departments

SPECIAL MACHINES
For any special plating
or cleaning sequence

Equipment tailored to fit your requirements, making every operation in the plating sequence automatic, or as mechanized as possible, is the profitable way to handle electroplating on a production basis. This Meaker method applies equally well to departments with only moderate daily output and to the largest and heaviest plating needs of the mass production plants. It offers not only a lower unit cost, but the production is increased, and a better and more uniform quality is assured.

Write for the full information. Ask for Booklet 148



THE MEAKER COMPANY

1637 South 55th Ave., Chicago 50, Ill.
Telephone CRawford 7-7202

NEWS OF INDUSTRY

to be able to replace worn out plants."

Mooney recommended that the Wisconsin businessmen take vigorous action to meet current financial problems. He urged them to watch inventories closely to cope with sudden shifts in demand.

"We must protect our cash position and maintain a dynamic organization at all costs. We must speak out against higher tax rates. And above all, we must take whatever steps are necessary to protect our productive capacity," Mooney concluded.

Race Intrigues Pittsburgh

Pittsburgh

• • • Though it was the least serious event on the program, a steamboat race stole the show on May 21, the final day of Pittsburgh's two "Welcome Weeks." The race between Carnegie-Illinois' "Home-stead" and Jones & Laughlin's "William Larimer Jones" was a publicity man's dream come true.

Carnegie president Charles R. Cox had, after some effort, been persuaded to telephone Adm. Ben Moreell, president and board chairman of J & L, challenging him to a river duel. The Admiral, after some persuasion, accepted. The craft selected normally push coal barges and are almost identical in every way.

To prove his sporting blood each steel company head agreed to be aboard his company's craft. Also aboard were a pair of columnists who had spent the previous 2 weeks disparaging each other's nautical ability. It was a grueling battle for the entire 1¼ miles from Neville Island to the Smithfield St. bridge. The "Home-stead" won by the diameter of a marlinspike.

Millsop Receives Citation

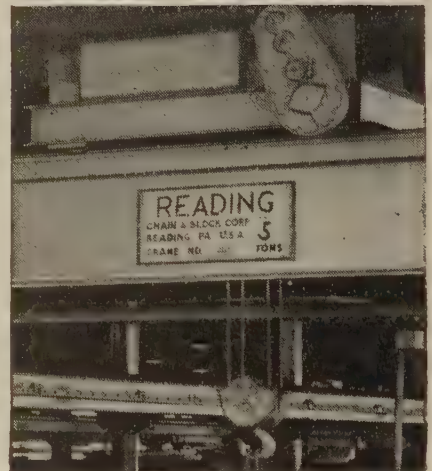
Weirton, W. Va.

• • • Thomas E. Millsop, president of Weirton Steel Co., received a citation from the National Society of Service Star Legion, Inc., recently at a testimonial dinner in the dining room of the Williams Country Club.

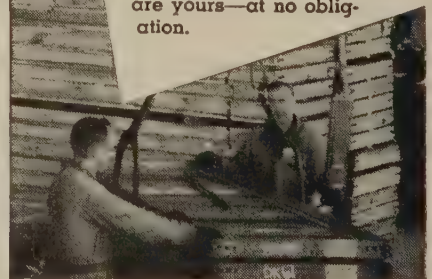
The citation was for Weirton Steel's contribution to the war effort in World War II, and for the company's humane treatment of disabled veterans.

FAST MATERIALS HANDLING

For YOUR New Building!



• New buildings, like new machines, are designed to increase output and reduce unit costs. That's why it pays to consult a Reading Engineer before you install handling equipment in a new shop or plant. For example, in this new annex, crates of sheet steel moved too leisurely from flat cars, to stock pile, to motor truck . . . until a Reading Engineer was consulted. After careful analysis, 2 specially-designed 5-ton Reading Cranes, equipped with electric push buttons were recommended and installed. Now crates "step lively", handling time is reduced . . . and fewer men move more materials, more easily! Start your new building "off on the right foot", now. For faster, more economical materials handling, call in a Reading Engineer. His experienced recommendations are yours—at no obligation.



READING CHAIN & BLOCK CORPORATION
2101 ADAMS ST., READING, PA.

Chain Hoists • Electric Hoists
Overhead Traveling Cranes

READING HOISTS

Yale & Towne Mfg. Co. Opens Pittsburgh Depot

Pittsburgh

• • • More than 500 industrial executives and plant maintenance men visited the new Pittsburgh facilities of Yale & Towne Mfg. Co. during a recent 2-day open house. The visits marked the official opening of the company's new building combining its sales offices with a spare parts and repair depot for mechanical handling equipment.

The expansion here is designed to give district users of Yale & Towne trucks, hoists and scales faster spare parts and repair service and to provide a salesroom where machines can be demonstrated to prospective customers. Samuel W. Gibb, general sales-manager of the company's Philadelphia Div., said that every important industrial region in the United States will be similarly served. Facilities similar to those at Pittsburgh are now being built in Chicago.

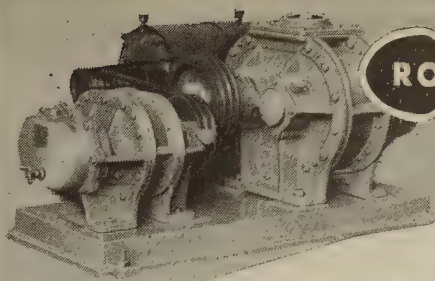
A clue to the importance of power trucks in this area was contained in the disclosure that a large sheet mill here uses 107 trucks, at a total investment of about \$2.5 million. In the entire district there are more than 1000 Yale power trucks alone.

Increases Electrode Output

Niagara Falls, N. Y.

• • • The Great Lakes Carbon Corp. will increase its electrode production this summer when it begins commercial operations at its Morganton Works, Morganton, N. C., according to Robert G. Allen, vice-president and general manager of Electrode Div. For nearly 2 years the North Carolina graphite electrode plant has been utilized for the Atomic Energy Commission.

Production schedules at the huge plant are being developed so that regular shipments of graphite electrodes, anodes and specialties will begin this summer. By the last quarter of 1949 it is expected that adequate production to meet the needs of basic industries where graphite and carbon products play essential parts will be achieved.



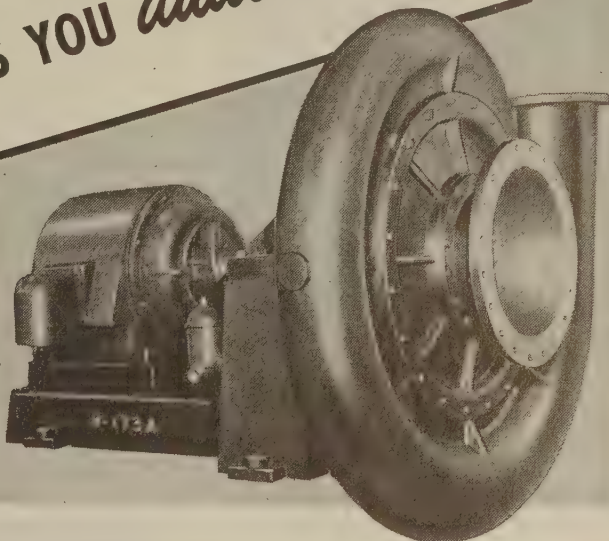
ROTARY

R-C Blower and Gas Booster mounted on same bedplate, with V-belt drives from 5 HP motor. Capacity, 125 CFM.

**ONLY R-C dual-ability
GIVES YOU dual choice**



R-C Centrifugal Blower
—24" type OIB, driven
by 250 HP motor. Capacity,
15,220 CFM.



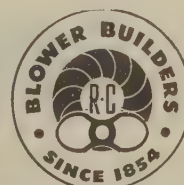
When it comes to choosing between Centrifugal and Rotary Positive Blowers and Exhausters, you'll get impartial suggestions from R-C *dual-ability*. That's because we build both—and we are the only blower manufacturer who gives you the benefit of this *dual choice*.

Another advantage of consulting us results from our wide range of units of both types. If it's 10 CFM you need, we'll supply it. Or, if your use calls for extremely large volume, we build them to any desired size.

One more point—air or gas handling equipment is our "bread and butter" . . . we have no other business. That means detailed and *interested* attention to your requirements from an organization that has specialized on that job for almost a century.

ROOTS-CONNERSVILLE BLOWER CORPORATION
906 Ohio Avenue, Connersville, Indiana

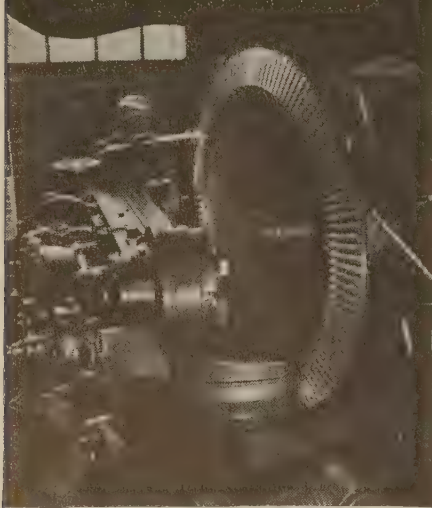
ROOTS-CONNERSVILLE



BLOWERS • EXHAUSTERS • BOOSTERS • LIQUID AND VACUUM PUMPS • METERS • INERT GAS GENERATORS

* * **ONE OF THE DRESSER INDUSTRIES** * *

LARGE INDUSTRIAL GEARS



Bevel and mitre gears up to 60" dia. are cut on gear planers to accurate tolerances.

CUSTOM MADE GEARS

up to 145" diameter

You can save time, money and errors in your large and heavy industrial gear requirements with the prompt, custom service of SIMONDS GEAR. Within easy shipping distance of many heavy industry plants—with a personalized attention to your specific gear requirements—SIMONDS GEAR is able to assure you fast, accurate gear service for all heavier gear needs. Size range includes: Spur Gears up to 145"—Bevel and Mitre Gears up to 60"—Worm Gears up to 72"—also worms, worm gears, racks and pinions. Materials include: cast or forged steel, gray iron, bronze, silent steel, rawhide and bakelite. Place your next heavy gear inquiry with SIMONDS GEAR and test the difference!

Stock carrying distributors for Ramsey Silent Chain Drives and Couplings. V-Belts.



THE
SIMONDS
GEAR & MFG. CO.
LIBERTY at 25th • PITTSBURGH 22, PA.

Sets Third Quarter Export Quota For Nonferrous Metals

Washington

••• An export quota of 15,000 short tons has been established for aluminum sheet, plate and strip for

for refined copper in cathodes, billets, ingots or other forms remains at 27,500 tons, the same as it was for the second quarter.

Nonferrous metals, manufactures or minerals for which third quarter quotas have been increased over those in effect for the second quarter are:

Schedule B Number	Commodity	2nd Quarter (Short Tons)	3rd Quarter (Short Tons)
641300	Scrap Copper	2,500	4,000
650750	Lead Pigs, Bars and Anodes (includes blocks and ingots)	1,200	3,000
651200	Lead Solder	100 (tin content)	150 (tin content)
662000	Babbitt Metal	100 (tin content)	150 (tin content)

the third quarter of 1949, the Office of International Trade announced recently. License applications under this quota may be filed with OIT from May 23 through June 10.

The third quarter quota is the same as the second quarter quota which was originally established at 9000 tons, but on May 6 was increased by a supplemental 6000 tons. Final date for filing license applications under this supplemental quota is May 20.

The third quarter export quota

For all other major nonferrous metals, manufactures or minerals under export control third quarter quotas remain unchanged from the second quarter, with most under "open-end" licensing provisions.

License applications for third quarter shipments of nonferrous materials under quantitative quotas, other than aluminum, may be filed from June 1 through June 20. License applications for "open-end" commodities may be filed at any time.

"New Process"

Punches • Dies • Rivet Sets

Compression Riveter Dies

Chisel Blanks

Made from high-grade alloy tool steels properly heat-treated, of uniform high quality — may be purchased with complete confidence for maximum service.

Write for Catalog 46

GEO. F. MARCHANT COMPANY

1420-34 So. ROCKWELL ST., CHICAGO 8, ILL.

BM Report Describes Alaskan Tin Deposits

Washington

• • • Wartime exploration of the Potato Mountain tin placer district near the tip of the Seward Peninsula in Alaska—one of the few places on the North American continent where tin has ever been mined commercially—is described in a recent report of the Bureau of Mines.

The report describes the physical features and climate of the district, which lies 12 miles north of the Bering Sea and 9 miles south of the Arctic Ocean. The history and production of the area are outlined. The possibilities of obtaining an adequate water supply for placer operations are discussed. The report also describes the character of the placer deposits, as well as the placer workings. No lode tin of commercial grade has been found in the area.

A field party of the United States Geological Survey was in the area while the Bureau of Mines investigation was being carried out, and prepared maps included in the report. The publication also gives drill-hole logs.

A free copy of Report of Investigations 4418, "Investigation of Potato Mountain Tin Placer Deposits, Seward Peninsula, Northwestern Alaska," by Harold E. Heide and F. A. Rutledge, Bureau mining engineers, can be obtained from the Bureau of Mines, Publications Section, 4800 Forbes St., Pittsburgh 13, Pa.

Receives McFarland Award

Pittsburgh

• • • George V. Luerssen, chief metallurgist for the Carpenter Steel Co., was presented with the first annual David Ford McFarland Award by the Penn State Chapter of the American Society for Metals at a recent dinner meeting of the chapter.

At the request of the award committee, Dr. D. F. McFarland presented a hand-lettered certificate to Mr. Luerssen. This annual award is made to a Penn State metallurgist who is judged to have attained eminence in his profession so as to bring credit upon himself and upon his Alma Mater.

OVER ONE HUNDRED YEARS OF CONTINUOUS SERVICE. ROUNDS, SQUARES, FLATS, HEXAGONS, OCTAGONS



*high strength
real toughness
long wearing
free cutting*

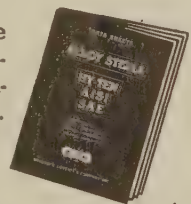
... an exceptionally adaptable alloy steel

HY-TEN "B" No. 2 alloy steel combines a high degree of strength, toughness, and fine wearing qualities with *exceptional free-cutting properties* in the natural rolled condition. Think of the economies afforded through the elimination of costs and delays of annealing. This adaptable alloy steel works cleanly and freely — prevents clogging in boring and deep hole drilling. While customarily used in the as-rolled condition, "B" No. 2 is often oil tempered with excellent results.

HY-TEN "B" No. 2 is ideally suited to such applications as tool and die bodies, spindles, shafts, shanks, gears, pinions, racks, worms and lead and feed screws.

WL steels are metallurgically constant. This guarantees uniformity of chemistry, grain size, hardenability—thus eliminating costly changes in heat treating specifications.

Write today for your FREE COPY of the Wheelock, Lovejoy Data Book. It contains complete technical information on grades, applications, physical properties, tests, heat treating, etc.



**WHEELOCK,
LOVEJOY & CO.,
INC.**

126 Sidney St., Cambridge 39, Mass.

HY-TEN
and **AISI**

Warehouse Service

CAMBRIDGE • CLEVELAND
CHICAGO • HILLSIDE, N.J.
DETROIT • BUFFALO
CINCINNATI

In Canada

SANDERSON-NEUBOUL, LTD., MONTREAL
AJAX DISTRIBUTING CO., LTD., TORONTO

BILLETS AND FORGINGS FOR PRODUCTION, TOOL ROOM AND MAINTENANCE REQUIREMENTS.

Machine Tool Sales in Doldrums with Competition for New Orders

••• Machine tool sales were in the doldrums this week as competition for business moved toward a postwar peak in the domestic market.

Reports on new business from major segments of the industry range from "poor" to "terrible." In the midwest some pickup in inquiries during the past 2 weeks was reported, but otherwise new business is practically nonexistent. A lot of equipment is out on quotation, much of it for the past 6 months or longer, but the orders which were expected to materialize shortly after the first of the year are still dangling.

In Chicago spotty business has prevailed in all lines of machine tools for the last 30 days. Most buyers are extremely hesitant and no large tooling programs have been placed since Buick at Flint placed their large press order for 1951 body work.

Much of this order was for fender stampings and included large automatic transfer presses, gap presses and open back reclinables.

Since early this year quotations on all presses, except open back reclinable types, have been showing price cuts. On the average the prices quoted are 5 to 10 pct lower than late last year. Usually such quotations are good for 30 days only. The cuts, press makers say, have not been large enough to entice a noticeable new volume of orders. Manufacturers now claim they can't cut prices further and they have squeezed all excessive costs out of their present figures.

What buying is being done on machine tools in general is largely by the bigger companies. The strong trend of automaticity of operation continues. Manufacturers are trying hard to cut labor costs by using better and more efficient machinery.

Customers are telling the gen-

Practically No New Business With Many Quotations For Presses Showing Cuts

o o o

eral machinery salesmen they will favor those manufacturers or sellers who cut prices. This stand hasn't helped matters and it has caused some buyers who need machinery and are going to buy, to adopt a "let's wait and see" attitude. One line of surface grinders was cut about 10 pct in price recently. Again this price reduction did not cause any perceptible increase in order volume.

In Cleveland, L. D. McDonald, president, National Machine Tool Builders' Assn. and vice-president, Warner & Swasey Co., told THE IRON AGE this week that third quarter sales outlook for the industry is "not good."

Pointing out that very few machine tool companies are working more than 32 hr per week and that the industry as a whole is operating at about 20 pct of its wartime peak, he warned that a series of crippling strikes in the basic industries would make prospects worse.

According to Mr. McDonald, there must be some basis for anticipation of increasing profits to make manufacturers invest in capital goods. At present, machine tool buyers are worried.

He said the following factors are essential to stabilizing the economy and starting the flow of capital goods expenditures: a stable wage pattern, with no fourth or fifth round wage increases; no increases in taxes; a new and immediate emphasis on economy in government; and, some definite recognition on

the part of government of more realistic depreciation policies.

On the other hand, ECA spending will be greater during the next fiscal year beginning with the third and fourth quarters this year, Mr. McDonald said.

In Detroit "pencil" activity is continuing at an accelerated pace, but as one prominent source characterized the present situation, "quotations come and quotations go, but nothing ever happens."

Available information indicates that deliveries for the new Continental engine plant at Muskegon have been stepped up. It is expected that another 60 days at least will be required to complete this program. There is some activity by both Ford and GM but at the moment GM divisions like Olds and Buick are reported very quiet.

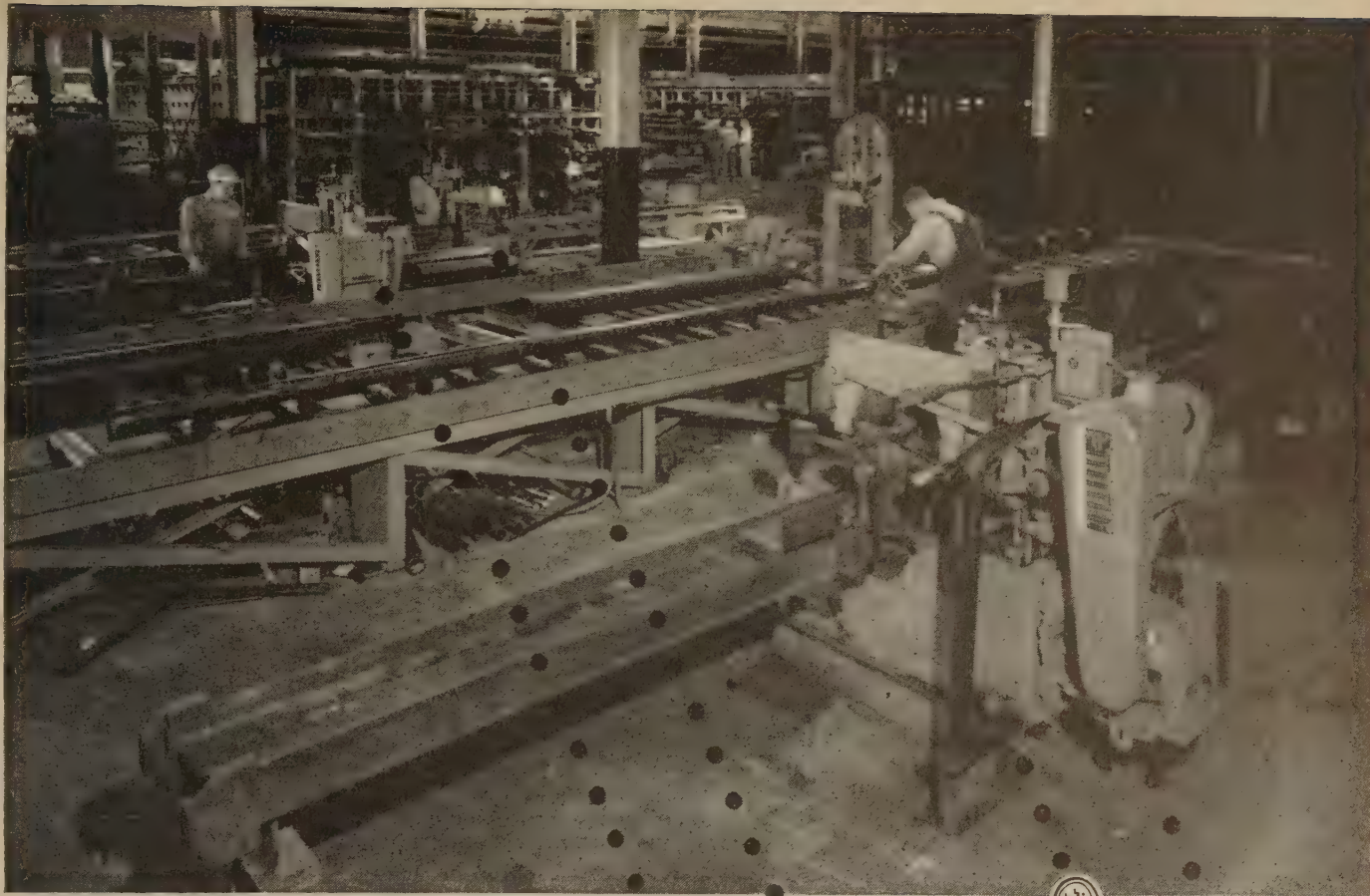
A flurry of excitement occurred here this week when an announced showing of new machine tools was canceled, apparently at the request of the buyer. The new equipment is to be used to produce parts for an automatic transmission.

Some new foreign business has appeared recently and there has been some activity reported on ordinance projects.

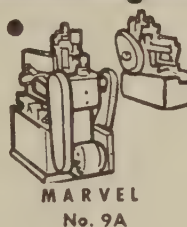
Machine tool builders in this area are watching with interest the outcome of demands served on local tool and die shops recently. Estimated to cost 43¢ per hr, the union demands include pensions, insurance and a 10¢ wage boost.

The purchase of George Keller Machinery Co., Buffalo, and merger with C. H. Briggs Machine Tool Co., Inc., Syracuse, N. Y., has extended the area of coverage and service of Rudel Machinery Co., New York.

Newly acquired companies have been consolidated as the C. H. Briggs Div. of Rudel Machinery Co. C. H. Briggs, who will manage the division, has been elected vice-president of Rudel.

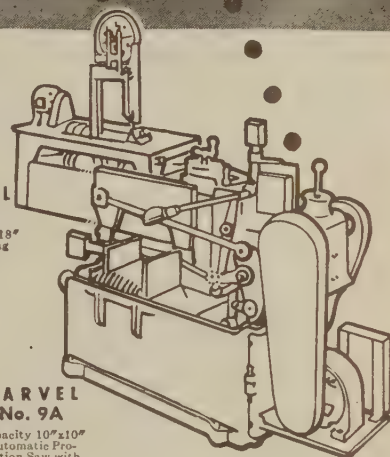


capacity for... "Cut to length" SERVICE!



**MARVEL
No. 6A**
Capacity 6"x8"
Automatic Pro-
duction Saw with
Bar push-up

**MARVEL
No. 8**
Capacity 18"x18"
Metal-Cutting
Band Saw



**MARVEL
No. 9A**
Capacity 10"x10"
Automatic Pro-
duction Saw with
Bar push-up

This recently enlarged, giant, Joseph T. Ryerson & Son, Inc., steel warehouse has cutting-off capacity to give fast service on any conceivable volume. Equipped with one Series 6A MARVEL Automatic Production Hack Saw, four Series 9 MARVEL High Speed Hack Saws and a No. 8 MARVEL Band Saw, the warehouse can deliver single or literally thousands of cut-to-length pieces on short notice—pieces cut to order from bars, tubes or shapes.

MARVEL-cut pieces from this warehouse will be accurately and squarely cut. It always pays to buy steel from MARVEL equipped warehouses.

Above: One cutting-off department of the Joseph T. Ryerson & Son, Inc., steel warehouse at Philadelphia.



ARMSTRONG-BLUM MFG. COMPANY

5700 BLOOMINGDALE AVENUE

"The Hack Saw People"

CHICAGO 39, U. S. A.

NONFERROUS METALS

... News and Market Activities

Price Slashing Series Halted But Metals Markets Remain Dull

New York

•••The steady stream of price reductions in nonferrous metals appears to have come to a pause, at least for a time. The only reduction in primary metals last week was in the price of zinc, $\frac{1}{4}\phi$, which brought down the price to 10.75¢ East St. Louis. This development occurred on June 2. Reductions of 1.25¢ to 2.00¢ were announced by brass and bronze ingot producers. Scrap prices held fairly steady, the only development being a lower smelting charge in battery plates, now \$65 a ton, due to the drying up of lead scrap. This served to raise dealers' buying prices for battery plates to a range of $4\frac{1}{4}\phi$ to $4\frac{1}{2}\phi$ per lb.

Brass mills have not put into effect any new product prices based on the most recent copper, zinc and lead reductions. There is no disposition on the part of the mills to make any further reductions in prices at this time. Mills are not breaking even at the present rate of operations. Several mills report a recent minor pickup in business, but operations are estimated to range from 35 to 40 pct of capacity. Mills would reduce their prices now only to meet competition.

Further reductions in primary metals prices may, of course, be initiated by the custom smelters, a practice which is customary in times of low order volume. Primary producers find they have no advantage to gain by further price reductions until buying begins again. The markets for copper, lead and zinc are quiet or inactive. At best, only carload tonnages are moving.

Prices are close to or below OPA schedules when premium payments are taken into consideration. In the depths of the prewar depression copper consumption by the United States did not drop much below 400,000 tons, and in 1936

Brass Mill Operations Are Estimated At 35 to 40 Pct of Capacity

o o o

and 1937 U. S. consumption was more than 800,000 tons. But only about 450,000 tons of domestic copper a year was mined without premiums during the war. The balance of some 500,000 tons required premium payments. Since that time there have been three rounds of wage increases and increases in freight rates to the extent of 66 pct.

Some observers believe that although there may be some further reductions in prices, once buying is resumed such prices will not hold long. Custom smelters have only a limited capacity which can be very quickly surpassed by the volume of normal demand.

The most recent evidence of the impact of the current market and its price levels for metals is the action taken by Anaconda Copper Co. in suspending operations at the Belmont copper mine and Orphan Girl zinc mine. The company has also suspended operations on the Greater Butte project. The action supplements previous suspensions at two other zinc mines of the company. In some quarters it is felt that mine closings should probably be stepped up by the industry in order to prevent very heavy inventory accumulations which would be a threat to the market.

Senate and House have passed a second deficiency bill which carries an interim appropriation of \$40 million for stockpiling to June 30, 1949. A meeting is scheduled for this week between the Munitions Board and the Metal Advisory Committee. The deficiency appropriation measure must still go to conference committee, but it is certain that it would not take very long to place the \$40 million for copper, lead and other metals.

The brass mills are now engaged in negotiations on the demands presented by the unions. These include a substantial wage increase, including 40 hr pay for a standard 35 hr work week, plus a third week of paid vacation and other fringe benefits. Members of the industry consider these demands unrealistic in the present state of the market. Whether the mills would find it necessary to close down rather than grant a portion of the demands could not be learned. It is certain that the opposition to the union objectives will be stiff.

Brass mill officials generally believe that there will be no important change in their order volume at least until the end of the summer. It is the impression that a much longer time will be required to bring the market back to normal than had originally been expected.

In the ingot markets, producers of brass ingots find their operations no better than at the lowest ebb of the depression. Aluminum ingot producers have found a slight pickup in orders with a firming tendency in the market.

Nonferrous Metals Prices

	June 1	June 2	June 3	June 4	June 6	June 7
Copper, electro, Conn.	17.625	17.625	17.625	17.625	17.625	17.625
Copper, Lake, Conn.	18.625	18.625	18.625	18.625	18.625	18.625
Tin, Grade A, New York . . .	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03
Zinc, East St. Louis	11.00	10.75	10.75	10.75	10.75	10.75
Lead, St. Louis	11.85	11.85	11.85	11.85	11.85	11.85

Note: Quotations are going prices.

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	16.00
Antimony, American, Laredo, Tex.	38.50
Beryllium copper, 3.75-4.25% Be	
dollars per lb contained Be	\$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	\$52.00
Bismuth, ton lots	\$2.00
Cadmium, del'd	\$2.00
Cobalt, 97-99% (per lb)	\$1.80 to \$1.87
Copper, electro, Conn. Valley	17.625
Copper, lake, Conn. Valley	18.625
Gold, U. S. Treas., dollars per oz.	\$35.00
Indium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$100 to \$110
Lead, St. Louis	11.85 to 14.80
Lead, New York	12.00 to 15.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask f.o.b. New York	\$82 to \$84
Nickel, electro, f.o.b. New York	42.93
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$72 to \$75
Silver, New York, cents per oz.	71.50
Tin, Grade A, New York	\$1.03
Zinc, East St. Louis	10.75
Zinc, New York	11.45
Zirconium copper, 10-12 pct Zr, per lb contained Zr	\$12.00

Remelted Metals

Brass Ingot

(Published prices, cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	14.25*
No. 120	13.75*
No. 123	13.25*
80-10-10 ingot	
No. 305	20.00
No. 315	17.00
88-10-2 ingot	
No. 210	26.50
No. 215	23.50
No. 245	17.00*
Yellow ingot	
No. 405	11.75*
Manganese bronze	
No. 421	18.00

* F.o.b. Philadelphia.

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	19.00-19.50
0.60 copper, max.	18.50-19.00
Piston alloys (No. 122 type)	16.00-16.50
No. 12 aluminum (No. 2 grade)	14.75-15.25
108 alloy	15.50-16.00
195 alloy	17.00-17.50
13 alloy	18.50-19.00
AXS-679	15.75-16.25

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-95½%	15.75-16.25
Grade 2—92-95%	14.75-15.25
Grade 3—90-92%	13.75-14.25
Grade 4—85-90%	12.75-13.25

Electroplating Supplies

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	34½
Electrodeposited	28½
Rolled, oval, straight, delivered	31.84
Ball anodes	32½
Brass, 80-20	
Cast, oval, 15 in. or longer	30¾
Zinc, oval, 99.886, f.o.b. Detroit	22½
Ball anodes	20½
Nickel 99 pct plus	
Cast	59.00
Rolled, depolarized	60.00
Cadmium	\$2.15
Silver 999 fine, rolled, 100 oz. lots, per troy oz, f.o.b. Bridgeport, Conn.	79

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	48.00
Copper sulfate, 99.5 crystals, bbl.	9.10
Nickel salts, single or double, 4-100 lb bags, frt. allowed	18.00
Nickel chloride, 300 lb bbl.	24.50
Silver cyanide, 100 oz. lots, per oz.	59
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc sulfate, crystals, 22.5 pct, bags	6.75
Zinc sulfate, 25 pct, flakes, bbl.	7.75

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.8¢; 52S, 30.9¢; 24S-O, 24S-OAL, 29.8¢; 75S-O, 75S-OAL, 36.3¢; 0.081 in., 2S, 3S, 27.9¢; 4S, 61S-O, 30.2¢; 52S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 75S-O, 75S-OAL, 38¢; 0.032 in., 2S, 3S, 29.5¢; 4S, 61S-O, 33.5¢; 52S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 75S-O, 75S-OAL, 47.6¢.

Plate: ¼ in. and heavier: 2S, 3S, F, 23.8¢; 4S-F, 26¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 75S-F, 75S-FAL, 33.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 35.1¢ to 66¢; 11 to 13, 36.1¢ to 78¢; 23 to 25, 38.2¢ to \$1.07; 35 to 37, 45.7¢ to \$1.65; 47 to 49, 67.5¢ to \$2.41.

Rod, Rolled: 1.064 to 4.5 in., 2S-F, 3S-F, 34¢ to 30.5¢; Co'd-finished, 0.375 to 3.5 in., 2S, 3S, 36.5¢ to 32¢.

Screw Machine Stock: Drawn, ½ to 11/32 in., 11S-T8, R317-T4, 49¢ to 38¢; cold-finished, ½ to 1½ in., 11S-T8, 37.5¢ to 35.5¢; ¾ to 2 in., R317-T4, 37.5¢ to 34.5¢; rolled, 19/16 to 3 in., 11S-T8, 35.5¢ to 32.5¢; 2½ to 3½ in., R317-T4, 33.5¢ to 32.5¢. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.: 2S, 36¢ to 26.5¢; 52S, 44¢ to 32¢; 56S, 47¢ to 38.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 34¢; 75S-T6, 76¢ to 55¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed Base quantity 30,000 lb)

Sheet and Plate: Ma, FSA, ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 3, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-1.01; 22, 1.12-1.31; 24, 1.62-1.75. Specification grade higher.

Extruded Round Rod: M, diam in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢; 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16, \$1.14; 5/16 to ¾, \$1.02; ¾ to ¾, 76¢; 1 to 2 in., 65¢; 0.065 to 0.082, ¾ to 7/16, 85¢; ¾ to ¾, 62¢; 1 to 2 in., 57¢; 0.165 to 0.219, ¾ to ¾, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and shapes		
Hot-rolled	56	45
Cold-drawn	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks		40

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Sheets	Rods	Extruded Shapes
Copper	31.68		31.28
Copper, hot-rolled		27.53	
Copper, drawn		28.78	
Low brass	30.17	29.86	33.08*
Yellow brass	29.10	28.79	32.11*
Red brass	30.51	30.20	33.42*
Naval brass	34.15	28.21	29.46
Leaded brass		23.69	27.89
Commercial bronze	31.38	31.07	34.04*
Manganese bronze	37.65	31.55	33.05
Phosphor bronze, 5 pct	50.82	51.07	
Muntz metal	32.18	27.74	28.99

Everdur, Hercu-loy, Olym-ple, etc.	36.55	35.47	
Nickel silver, 10 pct	39.83	42.24	42.41
Architectural bronze			27.89
*Seamless tubing			

Scrap Metals

Brass Mill Scrap

(Cents per pound; add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turn-ings
Copper	15½	14¾
Yellow brass	13¾	12½
Red brass	14¾	13¾
Commercial bronze	14¾	13¾
Manganese bronze	13¾	12½
Leaded brass rod ends	13	

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	13.00
No. 2 copper wire	12.00
Light copper	11.00
Refinery brass	10.50*
Radiators	7.25

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper, wire	13.00
No. 2 copper, wire	12.00
Light copper	11.00
No. 1 composition	9.50
No. 1 comp. turnings	9.00
Rolled brass	8.25
Brass pipe	8.00
Radiators	8.00
Heavy yellow brass	7.50

Aluminum

Mixed old cast	8.50
Mixed old clips	8.50
Mixed turnings, dry	7.00
Pots and pans	8.50
Low copper	12.00

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	11	—11¼
No. 2 heavy copper and wire	10	—10¼
Light copper	10	—10¼
Auto radiators (unsweated)	6½	—6½
No. 1 composition	8½	—8½
No. 1 composition turnings	8½	—8½
Clean red car boxes	7½	—7½
Cocks and faucets	7½	—7½
Mixed heavy yellow brass	6½	—6½
Old rolled brass	6½	—6½
Brass pipe	7½	—8
New soft brass clippings	10½	—11
Brass rod ends	7	—7½
No. 1 brass rod turnings	6	—6½

Aluminum

Alum. pistons and struts	4	—4½
Aluminum crankcases	6	—6½
2S aluminum clippings	10	—10½
Old sheet and utensils	6	—6½
Borings and turnings	3	—3½
Misc. cast aluminum	6	—6½
Dural clips (24S)	6	—6½

Zinc

New zinc clippings	5	—5½
Old zinc	4	—4½
Zinc routings	3	—3½
Old die cast scrap	2	—2½

Nickel and Monel

Pure nickel clippings	17	—18
Clean nickel turnings	15	—16
Nickel anodes	17	—18
Nickel rod ends	17	—18
New Monel clippings	12½	—13½
Clean Monel turnings	9	—10
Old sheet Monel	8	—9
Old Monel castings	11	—12
Inconel clippings	6½	—7½
Nickel silver clippings, mixed	6	—6½
Nickel silver turnings, mixed	6	—6½

Lead

Soft scrap, lead	7	—7½
Battery plates (dry)	4½	—4½

Magnesium Alloys

Segregated solids	9	—10
Castings	5½	—6½

Miscellaneous

Block tin	70	—72
No. 1 pewter	47	—49
No. 1 auto babbitt	40	—42
Mixed common babbitt	9	—9½
Solder joints	10½	—11
Siphon tops	45	—47
Small foundry type	11½	—12
Monotype	9½	—10
Lino. and stereotype	9	—9½
Electrotype	7	—7½
New type shell cuttings	9	—9½
Hand picked type shells	4½	—5
Lino. and stereo. dross	5	—5½
Electro. dross	3½	—4

For RELIABILITY use CLEVELAND'S



● For many years Cleveland Presses have been used by the automotive industry. In this highly systematized field delays are extremely costly. The production line must maintain a smooth flow of parts at all times. It is a testimonial of the highest sort to the Reliability of Cleveland Presses that they are in demand by this great industrial group.

Shown here are a group of five Cleveland Presses in one of the nation's automotive plants. They are used in a parts production line, working around the clock. They were chosen for reliability shown by earlier Cleveland Presses... their ability to stand up under the punishment called for in high speed production.

For complete information on all models of CLEVELAND PRESSES write for folder 52

PUNCHING TOOLS & DIES

OFFICES AT:
NEW YORK... CHICAGO
DETROIT... PHILADELPHIA
PITTSBURGH

**THE
CLEVELAND
PUNCH & SHEAR WORKS CO.
U.S.A.**

Established 1880

..... **POWER PRESSES**

FABRICATING TOOLS

CLEVELAND 14, OHIO

Price Weakness Still Haunts Market

New York

... Many in the scrap trade are beginning to wonder how low prices can go before there will be any large-scale buying. Foundries are only a small market factor now since many are working only 3 days a week. Mill buying has not developed and some observers say that there will not be any to speak of until September.

THE IRON AGE scrap composite was down another 8¢ per gross ton this week. It is now \$21.67 per gross ton which is a new low for the year. This represents a drop of \$21.33 per gross ton since the first of the year. Prices of No. 1 heavy melting steel this week are: Pittsburgh, \$22 to \$23; Chicago, \$21 to \$22; and Philadelphia, \$20.50 to \$21.50.

All areas showed further price weaknesses with some areas being more vulnerable than others. Brokers have been finding it increasingly difficult to sell at quoted prices. There has been some evidence of sales above market prices, but only for small tonnages and immediate delivery.

Trade circles do not expect any increase in scrap prices in the immediate future, but are of the opinion that they could go lower. Many dealers have reduced operations because it is unprofitable to operate at today's prices. Some dealers are stockpiling but others want no part of it because there is a possibility of taking a loss on future sales. On some items prices are so low already that dealers will not make any more transactions because it does not pay for yard overhead and still include a small profit.

PITTSBURGH—A substantial tonnage of railroad heavy melting steel was bought during the past week to deliver at \$24. However, a good tonnage of Pennsylvania R.R. No. 1 steel went at \$24.50 delivered. Railroad specialties were off \$1.50 a ton on local purchases. A representative tonnage of low phos. sold for \$24.50, off \$1 from the previous quotation, though one mill is still paying its customers \$25.50 for this grade. Brokers are now generally operating on a \$1 a ton profit margin. Therefore openhearth and foundry grades are now quotable with a spread of \$1, which in effect reduces the average IRON AGE Pittsburgh district quotations. At the beginning of this week no major mills were in the market for anything and re-

cent purchases will not be able to hold current quotations unless there is some buying soon.

CHICAGO—Last week the market was listless. Little activity by consumers was evident. Some brokers are trading light tonnages. Offers to mills which have been evident are drying up because brokers know the mills won't buy. This week No. 1 dealer bundles are added to the list. Such bundles must come from dealers' yards. All other No. 1 bundles must be factory made and to take care of this condition the item No. 1 bundles was changed to factory bundles a few weeks ago. Most trading in high grade bundles is strictly on the factory item but the trade believes No. 1 bundles from a yard must be shown, hence this addition.

PHILADELPHIA—The market here continued quiet last week. The closing down of the Phoenixville steel plant has increased the pessimism of the scrap trade because this plant was once a heavy scrap consumer. Prices quoted last week are still in effect but most factors in the market expect that further price weakness may develop in another week or two. There is considerable interest in the results of the Navy Yard sale to be held June 7. In a number of grades of scrap that have been inactive for some time, prices quoted may be considered nominal.

CLEVELAND—All grades except blast furnace were weaker here and in the Valley at press time in a market that apparently cannot be stimulated by lower prices. Brokers report shipments off 50 pct from May and resistance on all openhearth grades by consumers is anything but on the wane. In the continued absence of support, the trade foresees another \$5 decline in the market here and in the Valley during the June-July period. On the other hand, when the plant lists come out in July it is likely that some resumption of stockpiling by dealers will get underway. Very little stove plate is coming out at \$20-\$21, which is a nominal price, and the available tonnage is going into No. 1 machinery cast. Some segments of the trade here are being asked for quotations on No. 1 East and West coast ports for export.

CINCINNATI—Two of the major consumers in this district are now out of the market, while the third is releasing shipment on nominal tonnages, all of which has marked a new low in trading here. Foundries are taking nothing, according to brokers, who will buy nothing unless they have an immediate place for the tonnage. Dealers are laying off yard help and indications are that a resumption of trading on a substantial basis may not take place until September.

DETROIT—The condition of uncertainty and indecision which has prevailed here for the past month has increased this week as brokers and dealers, in contrast to a month ago, have been awarded substantial tonnages of industrial scrap which was sold during the past week. Meanwhile,

buying by mills has been negligible, leaving numerous scrap sources almost no choice but to stockpile. Both openhearth and cast grades are weaker this week although blast furnace material appears to be holding firm.

NEW YORK—Except for a few sales at lower prices, the market is still inactive. Consumers have not shown any willingness to buy and some are out of the market for the month of June. Foundries are working 3 to 4 days a week which has also limited the amount of scrap bought by this source. Some dealers in the area are closing down until there is an improvement in scrap prices. Others are stockpiling but to no avail since some No. 1 heavy melting has been sold for No. 2 heavy melting. Prices again weakened and No. 1 heavy melting was off 50¢. The cast grades were also off with the exception of mixed yard cast which remained unchanged from last week's quotation.

ST. LOUIS—Receipts of scrap iron in the St. Louis market were light the last week, as country dealers are resisting the lower prices which the material is bringing. It is not expected that the larger mills will come into the market again until July. Railroad lists: Chicago Burlington & Quincy, 4200 tons; St. Louis Southwestern, 1500 tons.

BOSTON—It is the same old story here. The market is so stagnant that dealers and brokers say they would rather not discuss it. If there is any commendable feature, it seems to be that prices are holding somewhat to their low levels and not dropping further. No. 1 heavy melting remains at \$14 to \$14.50.

BIRMINGHAM—From both a price and demand standpoint, the trend is down in this area. Openhearth grades are off \$2 per ton on very limited purchases and other grades are weaker. Dealers report that receipts have dropped off to about 10 pct of normal. The trucker has disappeared from the scrap scene, for the time being at least, and agricultural scrap is not being collected.

BUFFALO—The last reductions in openhearth grades pulled down the rest of the market by \$1 to \$4 a ton. Cupola cast was hardest hit, dropping to \$25 to \$26, without stirring any buying interest. An increase in the ingot rate and shutting down of a steel mill blast furnace was not expected to have any effect on this market. In fact, one veteran of the trade said conditions were the worst he had ever seen and anticipated no turn before autumn at the earliest.

SEATTLE—Little or no scrap is moving locally but occasional sales of No. 1 and No. 2 heavy have been made at \$17 per gross ton at the shipping point with the prevailing price delivered holding at about \$20 per gross ton. Both cupola cast and electric furnace prices cover a wide range with most of the former going at \$20 and the latter at \$22 per gross ton. Dealers report that falling prices have started another holding trend with everyone waiting for some indication of stabilization.

IRON AND STEEL SCRAP PRICES

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$22.00 to \$23.00
R.R. hvy. melting	23.50 to 24.50
No. 2 hvy. melting	20.00 to 21.00
No. 2 bundles	18.00 to 19.00
R.R. scrap rails	25.50 to 26.00
Rails 2 ft and under	29.50 to 30.00
No. 1 comp'd bundles	22.00 to 23.00
Hand bld. new shts.	20.00 to 21.00
Hvy. steel forge turn.	20.00 to 21.00
Mach. shop turn.	14.50 to 15.00
Shoveling turn.	17.50 to 18.00
Mixed bor. and ms. turn.	14.50 to 15.00
Cast iron borings	17.50 to 18.00
No. 1 mach. cast.	26.00 to 27.00
Mixed yard cast.	21.50 to 22.50
Hvy. breakable cast.	20.50 to 21.50
Malleable	24.50 to 25.00
R.R. knuck. and coup.	26.00 to 26.50
R.R. coil springs	26.00 to 26.50
R.R. leaf springs	26.00 to 26.50
Rolled steel wheels	26.00 to 26.50
Low phos.	23.50 to 24.50

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$21.00 to \$22.00
No. 2 hvy. melting	19.00 to 20.00
Factory bundles	21.00 to 22.00
No. 1 dealers' bundles	19.00 to 20.00
No. 2 dealers' bundles	17.00 to 18.00
Mach. shop turn.	11.00 to 13.00
Short shov. turn.	15.00 to 16.00
Cast iron borings	14.00 to 15.00
Mix. borings and turn.	10.00 to 12.00
Low phos. hvy. forge	25.00 to 25.50
Low phos. plates	24.00 to 24.50
No. 1 R.R. hvy. melt.	22.00 to 23.50
Rerolling rails	27.00 to 28.00
Miscellaneous rails	23.50 to 24.50
Angles and splice bars	25.00 to 26.00
Locomotive tires, cut	27.00 to 28.00
Cut boiler & side frames	23.00 to 24.00
Standard stl. car axles	27.00 to 28.00
No. 3 steel wheels	24.00 to 25.00
Couplers and knuckles	24.00 to 25.00
Rails, 2 ft and under	27.00 to 29.00
Malleable	24.00 to 25.00
No. 1 mach. cast.	27.00 to 28.00
No. 1 agricul. cast.	25.00 to 26.00
Heavy breakable cast.	22.00 to 23.00
R.R. grate bars	18.00 to 18.50
Cast iron brake shoes	18.00 to 18.50
Cast iron car wheels	27.00 to 29.00

CINCINNATI

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	\$19.00 to \$20.00
No. 2 hvy. melting	18.00 to 19.00
No. 1 bundles	18.00 to 19.00
No. 2 bundles	16.00 to 17.00
Mach. shop turn.	8.00 to 9.00
Shoveling turn.	9.00 to 10.00
Cast iron borings	9.00 to 10.00
Mixed bor. and turn.	8.00 to 9.00
Low phos. 18 in. under	24.00 to 25.00
No. 1 cupola cast.	26.00 to 27.00
Hvy. breakable cast.	18.00 to 19.00
Rails 18 in. and under	31.00 to 31.50
Rails random length	21.00 to 22.00
Drop broken	29.00 to 30.00

BOSTON

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$14.00 to \$14.50
No. 2 hvy. melting	11.50 to 12.50
No. 1 bundles	12.50 to 13.00
No. 2 bundles	10.50
Bushelings	10.00 to 11.00
Shoveling turn.	9.00 to 9.50
Machine shop turn.	5.75 to 6.50
Mixed bor. and turn.	5.00 to 5.50
C'n cast chem. bor.	10.00 to 12.00
No. 1 machinery cast.	26.00 to 30.00
No. 2 machinery cast.	22.00 to 24.00
Heavy breakable cast.	17.50 to 18.50
Stove plate	16.00 to 17.00

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting	\$15.50 to \$16.00
No. 2 hvy. melting	13.00 to 13.50
No. 1 bundles	15.50 to 16.00
New busheling	15.50 to 16.00
Flashings	15.50 to 16.00
Mach. shop turn.	9.50 to 10.00
Shoveling turn.	10.50 to 11.00
Cast iron borings	10.50 to 11.00
Mixed bor. and turn.	9.50 to 10.00
Low phos. plate	15.50 to 16.00
Heavy breakable cast.	13.00 to 17.00
Stove plate	16.00 to 17.00
Automotive cast.	21.00 to 22.00
No. 1 cupola cast.	19.00 to 22.00

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$20.50 to \$21.50
No. 2 hvy. melting	18.50 to 19.50
No. 1 bundles	20.50 to 21.50
No. 2 bundles	16.50 to 17.50
Mach. shop turn.	12.00 to 13.00
Shoveling turn.	14.00 to 15.00
Mixed bor. and turn.	10.50 to 11.50
Clean cast chemical bor.	17.00 to 18.00
No. 1 machinery cast.	27.00 to 29.00
No. 1 mixed yard cast.	24.00 to 25.00
Hvy. breakable cast.	27.00 to 28.00
Hvy. axle forge turn.	19.50 to 20.50
Low phos. acid openhearth	23.00 to 24.00
Low phos. electric furnace	24.00 to 25.00
Low phos. bundles	20.50 to 21.00
R.R. steel wheels	24.00 to 25.00
R.R. coil springs	24.00 to 25.00
R.R. malleable	24.00 to 26.00
Cast iron carwheels	28.00 to 29.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$18.00 to \$19.00
No. 2 hvy. melting	17.00 to 18.00
No. 2 bundled sheets	15.00 to 16.00
Mach. shop turn.	10.00 to 11.00
Shoveling turnings	10.00 to 11.00*
Locomotive tires, uncut	21.00 to 22.00
Mis. std. sec. rails	21.00 to 22.00
Steel angle bars	26.00 to 27.00
Rails 3 ft and under	27.00 to 28.00
R.R. steel springs	23.00 to 24.00
Steel car axles	25.00 to 27.00
Brake shoes	21.00 to 22.00
Malleable	23.00 to 24.00
Cast iron car wheels	25.00 to 26.00
No. 1 machinery cast.	27.00 to 29.00
Hvy. breakable cast.	19.00 to 20.00
Stove plate	20.00 to 21.00

*June 2 quotation should have read 11.00 to 12.00.

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$18.00
No. 2 hvy. melting	18.00
No. 2 bundles	16.00
No. 1 busheling	18.00
Long turnings	13.00
Shoveling turnings	15.00
Cast iron borings	15.00
Bar crops and plate	22.50
Structural and plate	22.50
No. 1 cupola cast.	26.00
Stove plate	20.00
No. 1 R.R. hvy. melt.	\$20.00 to 20.50
Steel axles	22.00
Scrap rails	21.00
Rerolling rails	25.00
Angles & splice bars	24.00 to 25.00
Rails 2 ft & under	25.00 to 26.00
Cast iron carwheels	25.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$22.00 to \$22.50
No. 2 hvy. melting	19.00 to 19.50
No. 1 bundles	22.00 to 22.50
No. 2 bundles	17.50 to 18.00
Mach. shop turn.	12.00 to 12.50
Short shov. turn.	18.00 to 18.50
Cast iron borings	18.00 to 18.50
Low phos.	23.00 to 23.50

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$13.50 to \$14.00
No. 2 hvy. melting	12.00 to 12.50
No. 2 bundles	10.50 to 11.00
Mach. shop turn.	5.25 to 5.75
Mixed bor. turn.	5.25 to 5.75
Shoveling turnings	8.00 to 8.50
Machinery cast.	20.50 to 21.50
Mixed yard cast.	19.00 to 20.00
Heavy breakable cast.	19.50 to 20.00
Charging box cast.	19.50 to 20.00
Unstrp. motor blks.	14.50 to 15.50
C'n cast chem. bor.	11.00 to 13.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$20.50 to \$21.00
No. 2 hvy. melting	18.50 to 19.00
No. 1 bundles	18.50 to 19.00
No. 2 bundles	16.50 to 17.00
No. 1 busheling	18.50 to 19.00
Mach. shop turn.	11.00 to 11.50
Shoveling turn.	15.00 to 15.50
Cast iron borings	15.00 to 15.50
Mixed bor. and turn.	15.00 to 15.50
Cupola cast.	25.00 to 26.00
Mixed yard cast.	23.00 to 24.00
Stove plate	23.00 to 24.00
Small indus. malleable	19.00 to 20.00
Low phos. plate	21.50 to 22.50
Scrap rails	25.00 to 26.00
Rails 3 ft & under	32.00 to 33.00
R.R. steel wheels	25.00 to 26.00
R.R. coil & leaf spgs.	25.00 to 26.00
R.R. knuckles & coup.	25.00 to 26.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$19.50 to \$20.00
No. 2 hvy. melting	16.00 to 16.50
No. 1 bundles	19.50 to 20.00
No. 2 bundles	15.00 to 15.50
No. 1 busheling	19.50 to 20.00
Drop forge flashings	19.50 to 20.00
Mach. shop turn.	11.00 to 11.50
Shoveling turn.	18.00 to 18.50
Steel axle turn.	19.50 to 20.00
Cast iron borings	18.00 to 18.50
Mixed bor. & turn.	18.00 to 18.50
Low phos. 2 ft and under	21.50 to 22.00
No. 1 mach. cast.	28.00 to 28.50
Malleable	21.00 to 22.00
R.R. cast.	28.00 to 29.00
Railroad grate bars	20.00 to 21.00
Stove plate	20.00 to 21.00
R.R. hvy. melting	20.00 to 21.00
Rails 3 ft and under	29.00 to 30.00
Rails 18 in. and under	30.00 to 31.00

SAN FRANCISCO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$20.00
No. 2 hvy. melting	18.00
No. 1 bales	16.00
No. 2 bales	16.00
No. 3 bales	13.00
Mach. shop turn.	12.00
Elec. fur. 1 ft under	28.00
No. 1 cupola cast.	\$20.00 to 25.00
R.R. hvy. melting	20.00
Rails	23.00

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$20.00
No. 2 hvy. melting	18.00
No. 1 bales	16.00
No. 2 bales	16.00
No. 3 bales	13.00
Mach. shop turn.	12.00
Elec. fur. 1 ft under	30.00
No. 1 cupola cast.	\$24.00 to 26.00
R.R. hvy. melting	20.00

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	\$20.00
No. 1 & No. 2 bales	16.00
No. 3 bales	13.00
Elec. fur. 1 ft and under	22.00
No. 1 cupola cast.	\$20.00 to 27.00
R.R. hvy. melting	20.00

HAMILTON, ONT.

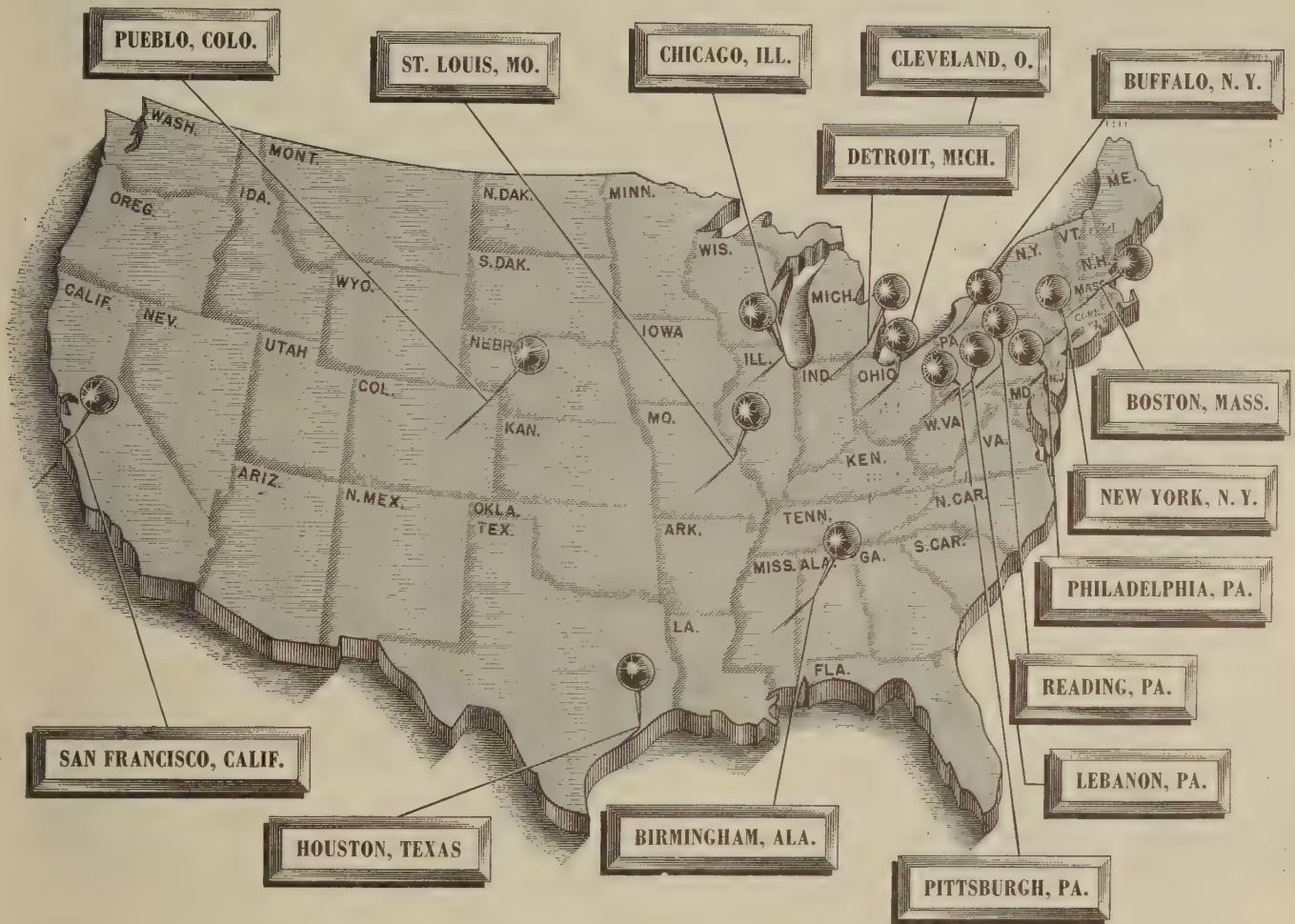
Per gross ton delivered to consumer: Cast Grades f.o.b. shipping point:

Heavy melting	\$23.00*
No. 1 bundles	23.00*
No. 2 bundles	22.50*
Mechanical bundles	21.00*
Mixed steel scrap	19.00*
Mixed borings and turnings	17.00*
Rails, remelting	23.00*
Rails, rerolling	26.00*
Bushelings	17.50*
Bushelings, new fact, prop'd	21.00*
Bushelings, new fact, unprop'd.	16.00*
Short steel turnings	17.00*
No. 1 cast.	\$48.00 to 50.00
No. 2 cast.	44.00 to 45.00

*Ceiling Price.

For the Purchase or Sale of Iron and Steel Scrap...

CONSULT OUR NEAREST OFFICE



The energy and integrity of our organization is ready to serve your best interests ...
Since 1889, Luria Brothers & Company, Inc. have made fair dealings their constant aim.

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

LURIA BROTHERS AND COMPANY, INC.

Main Office

LINCOLN-LIBERTY BLDG.
Philadelphia 7, Pennsylvania

Yards

LEBANON, PA. • READING, PA.
DETROIT (ECORSE), MICH.
MODENA, PA. • PITTSBURGH, PA.
ERIE, PA.



BIRMINGHAM, ALA.
Empire Bldg.

BOSTON, MASS.
Statler Bldg.

BUFFALO, N.Y.
Genesee Bldg.

ST. LOUIS, MO.
2110 Railway Exchange Bldg.

CHICAGO, ILL.
100 W. Monroe St.

CLEVELAND, O.
1022 Midland Bldg.

DETROIT, MICH.
2011 Book Bldg.

Branch Offices

HOUSTON, TEXAS
Cotton Exchange

LEBANON, PA.
Luria Bldg.

NEW YORK, N.Y.
Woolworth Bldg.

SAN FRANCISCO, CAL.
Pacific Gas & Elec. Co., Bldg.

PITTSBURGH, PA.
Oliver Bldg.

PUEBLO, COLO.
Colorado Bldg.

READING, PA.
Luria Bldg.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices . .

Price advances over previous week are printed in Heavy Type: declines appear in *Italics*.

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	June 7, 1949	May 31, 1949	May 10, 1949	June 8, 1948
(cents per pound)	1949	1949	1949	1948
Hot-rolled sheets	3.25	3.25	3.25	2.775
Cold-rolled sheets	4.00	4.00	4.00	3.495
Galvanized sheets (10 ga)	4.40	4.40	4.40	3.913
Hot-rolled strip	3.25	3.25	3.25	2.775
Cold-rolled strip	4.038	4.038	4.038	3.535
Plates	3.40	3.40	3.40	2.93
Plates wrought iron	7.85	7.85	7.85	7.25
Stains C-R strip (No. 302)	33.25	33.25	33.25	30.50

Tin and Terneplate:	June 7, 1949	May 31, 1949	May 10, 1949	June 8, 1948
(dollars per base box)				
Tinplate (1.50 lb) cokes	\$7.75	\$7.75	\$7.75	\$6.70
Tinplate, electro (0.50 lb)	6.70	6.70	6.70	5.90
Special coated mfg. ternes	6.65	6.65	6.65	5.80

Bars and Shapes:	June 7, 1949	May 31, 1949	May 10, 1949	June 8, 1948
(cents per pound)				
Merchant bars	3.35	3.35	3.35	2.875
Cold-finished bars	3.995	3.995	3.995	3.483
Alloy bars	3.75	3.75	3.75	3.213
Structural shapes	3.25	3.25	3.25	2.767
Stainless bars (No. 302)	28.50	28.50	28.50	26.00
Wrought iron bars	9.50	9.50	9.50	8.65

Wire:	June 7, 1949	May 31, 1949	May 10, 1949	June 8, 1948
(cents per pound)				
Bright wire	4.15	4.15	4.15	3.608

Rails:	June 7, 1949	May 31, 1949	May 10, 1949	June 8, 1948
(dollars per 100 lb)				
Heavy rails	\$3.20	\$3.20	\$3.20	\$2.725
Light rails	3.55	3.55	3.55	3.05

Semifinished Steel:	June 7, 1949	May 31, 1949	May 10, 1949	June 8, 1948
(dollars per net ton)				
Rerolling billets	\$52.00	\$52.00	\$52.00	\$45.00
Slabs, rerolling	52.00	52.00	52.00	45.00
Forging billets	61.00	61.00	61.00	54.00
Alloy blooms, billets, slabs	63.00	63.00	63.00	66.00

Wire rod and Skelp:	June 7, 1949	May 31, 1949	May 10, 1949	June 8, 1948
(cents per pound)				
Wire rods	3.40	3.40	3.40	3.133
Skelp	3.25	3.25	3.25	2.888

Pig Iron:	June 7, 1949	May 31, 1949	May 10, 1949	June 8, 1948
(per gross ton)	1949	1949	1949	1948
No. 2, foundry, Phila.	\$50.56	\$50.56	\$50.56	\$44.74
No. 2, Valley furnace	46.50	46.50	46.50	39.50
No. 2, Southern Cin'ti*	45.47	45.47	45.47	45.47
No. 2, Birmingham	39.38	39.38	39.38	39.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	39.00
Basic del'd Philadelphia*	49.74	49.74	49.74	44.24
Basic, Valley furnace	46.00	46.00	46.00	39.00
Malleable, Chicago†	46.50	46.50	46.50	39.50
Malleable, Valley	46.50	46.50	46.50	39.50
Charcoal, Chicago	73.78	73.78	73.78	65.55
Ferromanganese†	173.40	173.40	173.40	145.00

†The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

‡Average of U. S. prices quoted on Ferroalloy page.

*Does not include interim increase on total freight charges, effective Jan. 11, 1949.

Scrap	June 7, 1949	May 31, 1949	May 10, 1949	June 8, 1948
(per gross ton)				
Heavy melt'g steel, P'gh. \$22.50	\$22.75	\$22.75	\$22.75	\$40.25
Heavy melt'g steel, Phila. 21.00	21.00	21.00	22.00	42.50
Heavy melt'g steel, Ch'go 21.50	21.50	21.50	23.50	39.25
No. 1, hy. comp. sh't, Det. 15.75	16.75	16.75	16.75	35.50
Low phos. Young'n	23.25	23.75	24.75	45.25
No. 1, cast, Pittsburgh	26.50	27.75	27.75	63.75
No. 1, cast, Philadelphia	28.00	28.00	28.00	67.00
No. 1, cast, Chicago	27.50	27.50	28.00	69.50

Coke, Connellsville:	June 7, 1949	May 31, 1949	May 10, 1949	June 8, 1948
(per net ton at oven)				
Furnace coke, prompt	\$14.25	\$14.25	\$14.50	\$12.75
Foundry coke, prompt	16.25	16.25	16.50	14.00

Nonferrous Metals:	June 7, 1949	May 31, 1949	May 10, 1949	June 8, 1948
(cents per pound to large buyers)				
Copper, electro, Conn.	17.625	17.625	18.00	21.50
Copper, Lake Conn.	18.625	18.625	18.625	21.625
Tin, Grade A, New York	\$1.03	\$1.03	\$1.03	\$1.03
Zinc, East St. Louis	10.75	11.00	12.00	12.00
Lead, St. Louis	11.85	11.85	13.85	17.30
Aluminum, virgin	17.00	17.00	17.00	15.00
Nickel, electrolytic	42.93	42.93	42.93	36.56
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	38.50	38.50	38.50	35.00

Starting with the issue of May 12, 1949 the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive, see p. 139 of May 12, 1949 issue. The composite under the old method this week would have been 3.73330¢ per lb.

Composite Prices . .

FINISHED STEEL (Base Price)	
June 7, 1949	3.705¢ per lb.
One week ago	3.705¢ per lb.
One month ago	3.705¢ per lb.
One year ago	3.211¢ per lb.

PIG IRON		SCRAP STEEL	
June 7, 1949	\$45.91 per gross ton	June 7, 1949	\$21.67 per gross ton
One week ago	\$45.91 per gross ton	One week ago	\$21.75 per gross ton
One month ago	\$45.91 per gross ton	One month ago	\$22.75 per gross ton
One year ago	\$40.51 per gross ton	One year ago	\$40.66 per gross ton

HIGH		LOW	
1949	3.720¢ Jan. 1	3.705¢ May 3	
1948	3.721¢ July 27	3.193¢ Jan. 1	
1947	3.193¢ July 29	2.848¢ Jan. 1	
1946	2.848¢ Dec. 31	2.464¢ Jan. 1	
1945	2.464¢ May 29	2.396¢ Jan. 1	
1944	2.396¢	2.396¢	
1943	2.396¢	2.396¢	
1942	2.396¢	2.396¢	
1941	2.396¢	2.396¢	
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	
1939	2.35367¢ Jan. 3	2.26689¢ May 16	
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	
1933	1.95757¢ Oct. 3	1.75836¢ May 2	
1932	1.89196¢ July 5	1.83901¢ Mar. 1	
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	
1929	2.31773¢ May 28	2.26498¢ Oct. 29	

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

HIGH		LOW	
1949	\$46.82 Jan. 4	\$45.91 May 10	
1948	46.91 Oct. 12	39.58 Jan. 6	
1947	37.98 Dec. 30	30.14 Jan. 7	
1946	30.14 Dec. 10	25.37 Jan. 1	
1945	25.37 Oct. 23	23.61 Jan. 2	
1944	\$23.61	\$23.61	
1943	23.61	23.61	
1942	23.61	23.61	
1941	\$23.61 Mar. 20	\$23.45 Jan. 2	
1940	23.45 Dec. 23	22.61 Jan. 2	
1939	22.61 Sept. 19	20.61 Sept. 12	
1938	23.25 June 21	19.61 June 6	
1937	23.25 Mar. 9	20.25 Feb. 16	
1936	19.74 Nov. 24	18.73 Aug. 11	
1935	18.84 Nov. 5	17.83 May 14	
1934	17.90 May 1	16.90 Jan. 27	
1933	16.90 Dec. 5	13.56 Jan. 3	
1932	14.81 Jan. 5	13.56 Dec. 6	
1931	15.90 Jan. 6	14.79 Dec. 15	
1929	18.71 May 14	18.21 Dec. 17	

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

HIGH		LOW	
1949	\$43.00 Jan. 1	\$21.67 June 7	
1948	43.16 July 27	39.75 Mar. 9	
1947	42.58 Oct. 28	29.50 May 20	
1946	31.17 Dec. 24	19.17 Jan. 1	
1945	19.17 Jan. 2	18.92 May 22	
1944	19.17 Jan. 11	15.76 Oct. 24	
1943	\$19.17	\$19.17	
1942	19.17	19.17	
1941	\$22.00 Jan. 7	\$19.17 Apr. 10	
1940	21.83 Dec. 30	16.04 Apr. 9	
1939	22.50 Oct. 3	14.08 May 16	
1938	15.00 Nov. 22	11.00 June 7	
1937	21.92 Mar. 30	12.67 June 9	
1936	17.75 Dec. 21	12.67 June 8	
1935	13.42 Dec. 10	10.33 Apr. 29	
1934	13.00 Mar. 13	9.50 Sept. 25	
1933	12.25 Aug. 8	6.75 Jan. 3	
1932	8.50 Jan. 12	6.43 July 5	
1931	11.33 Jan. 6	8.50 Dec. 29	
1929	17.58 Jan. 29	14.08 Dec. 8	

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Johns-Manville

Announces...



JM-3000
Insulating
Fire Brick

**... sets a new high of 3000 F
for insulating fire brick service**



● Here is a new insulating fire brick, especially developed by the Johns-Manville Research Laboratory for use in forge furnaces, ceramic kilns, chemical process furnaces and other types

of high-temperature equipment operating above the previous range of insulating fire brick.

Some of the more outstanding advantages of JM-3000 Insulating Fire Brick are: It is the highest temperature insulating fire brick made for backup or exposed use, effectively withstanding the full 3000 F. Its efficiency remains at a high level throughout the life of the brick. It has exceptional service advantages in many operations at lower temperatures where regular or special fire brick is ordinarily used.

With its combination of outstanding insulating and refractory properties, JM-3000 Insulating Fire Brick has been found to provide longer life, greater fuel economy and important savings in downtime. For further information, write to Johns-Manville, Box 290, New York 16, N. Y.

PHYSICAL AND THERMAL PROPERTIES

Molded from high quality kaolin clays plus alumina

Density—63-67 lb per cu ft

Modulus of rupture—200 lb per sq in.

Linear shrinkage—(24 hr Panel test @ 3000 F) .8 per cent

Linear thermal expansion to 2000 F—.5 to .6 per cent

Pyrometric cone equiv.—Cone 37+ (3308 F+)

Temperature limit—3000 F

Conductivity (Btu in. per sq ft per F per hr at mean temp)

F	500	1000	1500	2000
Btu	3.10	3.20	3.35	3.60

Johns-Manville

First in
INSULATIONS

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. producing points in cents per pound unless otherwise indicated. Extras apply. (1) Widths up to 12-in. inclusive. (2) 0.25 carbon and less. (3) Cokes, 1.25 lb, deduct 25¢ per base box. (4) 18 gage and heavier. (5) For straight length material only from producers to fabricators. (6) Also shafting. For quantities of 40,000 lb and over. (7) Carload lot in manufacturing trade. (8) Hollowware enameling, gages 29 to 31 only. (9) Produced to dimensional tolerances in AISI Manual Sec. 6. (10) Slab prices subject to negotiation in most cases. (11) San Francisco only. (12) Los Angeles only. (13) San Francisco and Los Angeles only. (14) Seattle only. (15) Seattle and Los Angeles only.

PRODUCTS	Base prices at producing points apply to the sizes and grades produced in these areas														
	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Young- town	Spar- rows Point	Granite City	Middle- town, Ohio		Detroit	Johns- town	Seattle, S. Frisco, Los Angeles	Fontana
INGOTS Carbon forging	\$50.00											\$50.00			
Alloy	\$51.00						(per net ton)					\$51.00			
BILLETS, BLOOMS, SLABS Carbon, rerolling ¹⁰	\$52.00				\$52.00	\$52.00	(per net ton)						\$52.00		\$71.00
Carbon forging billets	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00	(per net ton)					\$61.00	\$61.00		\$80.00
Alloy	\$63.00	\$63.00				\$63.00	(Bethlehem, Canton, Massillon = \$63.00) (per net ton)					\$63.00			\$82.00
PIPE SKELP	3.25						3.25				Warren = 3.25				
WIRE RODS	3.40	3.40		3.40	3.40		3.40	3.50			Worcester 3.70		3.40	4.05 ¹¹ 4.20 ¹²	
SHEETS Hot-rolled ⁴	3.25	3.25	3.25	3.25	3.25	3.25 (Consho- hocken,	3.25	3.25 Pa. 3.35)		Warren, Ashland = 3.25		3.45		3.95 ¹³	4.15
Cold-rolled	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.20	4.00	Warren 4.00	4.20		Pittsburg, Cal. 4.95	4.90
Galvanized (10 gage)	4.40	4.40	4.40		4.40			4.40	Canton = 4.40	4.40	Ashland = 4.40			5.15 ¹³	
Enameling (12 gage)	4.40	4.40	4.40	4.40			4.40		4.60	4.40		4.70			
Long ternes (10 gage)	4.80		4.80							4.80					
STRIP Hot-rolled ¹	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25		3.25	Warren = 3.25	3.45		4.00 to 4.25	4.65
Cold-rolled ²	4.00	4.15		4.00		4.00	4.00	4.00		New Haven 4.50 Warren = 4.00 to 4.25		4.20 to 4.25			4.90
TINPLATE Cokes, 1.50 lb. ³ base box	\$7.75	\$7.75	\$7.75		\$7.85			\$7.85	\$7.95	Warren, Ohio = \$7.75				Pittsburg, Cal. = \$8.50	
Electrolytic 0.25, 0.50, 0.75 lb. box	Deduct \$1.30, \$1.05 and 75¢ respectively from 1.50 lb. coke base box price														
TERNES MFG., specia. coated	Deduct \$1.10 from 1.50 lb. coke base box price														
BLACKPLATE CANMAKING 55 to 128 lb.	Deduct \$2.00 from 1.50 lb. coke base box price														
BLACKPLATE, h.e., 29 ga. ⁶	5.30	5.30	5.30					5.40		Warren, Ohio = 5.30					
BARS Carbon Steel	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35		3.35	Canton = 3.35	3.55	3.35	4.05	4.00
Reinforcing (billet) ⁵	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35			Canton = 3.35		3.35	4.05 to 4.10	4.00
Cold-finished ⁸	3.95 to 4.00	4.00	4.00	4.00		4.00	4.00					4.30			
Alloy, hot-rolled	3.75	3.75	3.75			3.75	3.75	Bethlehem, Canton, Massillon = 3.75				4.05	3.75	4.80 ¹²	4.75
Alloy cold-drawn	4.65	4.65	4.65	4.65		4.65	4.65	Massillon = 4.65		Worcester 4.95					
PLATE Carbon steel ⁹	3.40	3.40	3.40	3.40	3.40 Consho- hocken	3.40	3.40 = 3.55	3.40 Coatesville = 3.50, Claymont = 3.50 Geneva = 3.40, Harrisburg = 3.95				3.65	3.40	4.30 ¹⁴	4.00
Floor plate	4.55	4.55		4.55				Conshohocken = 4.55							
Alloy	4.40	4.40							Coatesville = 4.50						
SHAPES, Structural	3.25	3.25	3.25		3.25	3.30	Bethlehem = 3.30, Geneva, Utah = 3.25						3.30	3.80 to 3.90 ¹⁴	3.80
MANUFACTURERS' WIRE ⁷ Bright	4.15	4.15		4.15	4.15		4.15	4.25	Duluth = 4.15, Worcester = 4.45				4.15	5.15 ¹¹	
Spring (high carbon)	5.20	5.20		5.20				5.30	Worcester = 5.50 New Haven, Trenton = 5.50				5.20	Duluth = 5.20-6.15	
PILING, Steel sheet	4.05	4.05				4.05									

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	Chromium Nickel							Straight Chromium		
	301	302	303	304	316	321	347	410	416	430
Ingot, rerolling	12.75	13.50	15.00	15.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, rerolling	17.00	18.25	20.25	19.25	30.25	24.50	26.75	15.00	18.50	15.25
Forg. discs, die blocks, rings	30.50	30.50	33.00	32.00	49.00	36.50	41.00	24.50	25.00	25.00
Billets, forging	24.25	24.25	26.25	25.50	39.00	29.00	32.75	19.50	20.00	20.00
Bars, wire, structurals	28.50	28.50	31.00	30.00	46.00	34.00	38.50	23.00	23.50	23.50
Plates	32.00	32.00	34.80	34.00	50.50	39.50	44.00	26.00	26.50-27.00	26.50
Sheets	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	35.50
Strip, hot-rolled	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	28.00	21.75
Strip, cold-rolled	30.50	33.00	36.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

ELECTRODES

Cents per lb. f.o.b. plant, threaded electrodes with nipples, unboxed

Diameter in in.	Length in in.	
Graphite		
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
Carbon		
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	84, 90	7.50¢
14	69, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	90.5¢
18	4	1	—	5	\$1.42
18	4	2	—	—	\$1.025
1.5	4	1.5	8	—	65¢
6	4	2	6	—	69.5¢
High-carbon-chromium					52¢
Oil hardened manganese					29¢
Special carbon					26.5¢
Extra carbon					22¢
Regular carbon					19¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.00¢
0.41 to 0.60 carbon	5.50¢
0.61 to 0.80 carbon	6.10¢
0.81 to 1.05 carbon	8.05¢
1.06 to 1.35 carbon	10.35¢

Worcester, add 0.30¢.

CLAD STEEL

Base prices, cents per pound

Stainless clad	Plate	Sheet
No. 304, 20 pct. f.o.b. Coatesville, Pa.	*26.50	
Washington, Pa.	*26.50	*22.50
Claymont, Del.	*26.50	
Conshohocken, Pa.		*22.50
Nickel-clad		
10 pct. f.o.b. Coatesville, Pa.		27.50
Inconel-clad		
10 pct. f.o.b. Coatesville.		36.00
Monel-clad		
10 pct. f.o.b. Coatesville.		29.00
Aluminized steel sheets		
Hot dip, f.o.b. Butler, Pa.		7.75

* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column	Pittsburg, Calif.
Standard & coated nails*	103	123
Galvanized nails*	103	123
Woven wire fence†	109	132
Fence posts, carloads††	114	130
Single loop bale ties	106	130
Galvanized barbed wire**	123	143
Twisted barless wire	123	130

* Pgh., Chi., Duluth; Worcester, 6 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth only.

Base per 100 lb Pittsburg, Calif.

Annealed fence wire†	\$4.80	\$5.75
Annealed, galv. fencing†	5.25	6.20
Cut nails, carloads††	6.75	...

† Add 30¢ at Worcester; 10¢ at Sparrows Pt.
†† Less 20¢ to jobbers.

ELECTRICAL SHEETS

24 gage, HR cut lengths, f.o.b. mill

Cents per lb

Armature	5.45
Electrical	5.95
Motor	6.70
Dynamo	7.50
Transformer 72	8.05
Transformer 65	8.60
Transformer 58	9.30
Transformer 52	10.10

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	\$3.20†
Joint bars, 100 lb	4.25
Light rails (from billets) per 100 lb	3.55

Base Price cents per lb

Track spikes	5.35
Axles	5.20
Screw spikes	8.00
Tie plates	4.05
Tie plates, Pittsburg, Calif.*	4.20
Track bolts, untreated	8.25
Track bolts, heat treated, to railroads	8.50

*Seattle, add 30¢

†CF&I, \$3.30.

HIGH STRENGTH, LOW ALLOY STEELS

Mill base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dynalloy	Hi Steel	Mayari R	Otiscoloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic Sharon*	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Sharon*
Plates	5.20	5.20	5.20	5.30	5.20	5.20	5.20	5.20	5.45
Sheets									
Hot-rolled	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	5.15
Cold-rolled	6.05	6.05	6.05	6.05	6.05	6.05	6.05	6.05	6.25
Galvanized	6.75	6.75	6.75	6.75	6.75	6.75	6.75	6.75	6.75
Strip									
Hot-rolled	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	5.15
Cold-rolled	6.05	6.05	6.05	6.05	6.05	6.05	6.05	6.05	6.25
Shapes		4.95	4.95	4.95	4.95	5.05	4.95	4.95	5.15
Beams		4.95	4.95	4.95	4.95	5.05	4.95	4.95	5.15
Bars									
Hot-rolled	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.30
Bar shapes		5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.30

* Sheets and strip.

PIPE AND TUBING

Base discounts, f.o.b. mills.
Base price, \$200.00 per net ton.

STANDARD, THREADED AND COUPLED

Steel, butt weld	Black	Galv.
1/2-in.	43 to 41	25 1/2 to 23 1/2
3/4-in.	46 to 44	29 1/2 to 27 1/2
1-in.	48 1/2 to 46 1/2	32 1/2 to 30 1/2
1 1/4-in.	49 to 47	33 to 31
1 1/2-in.	49 1/2 to 47 1/2	33 1/2 to 31 1/2
2-in.	50 to 48	34 to 32
2 1/2 to 3-in. ..	50 1/2 to 48 1/2	34 1/2 to 32 1/2
Steel, lap weld		
2-in.	39 1/2	25 to 23
2 1/2 to 3-in. ..	43 1/2 to 42 1/2	27 to 26
3 1/2 to 6-in. ..	46 1/2 to 42 1/2	30 to 26
Steel, seamless		
2-in.	38 1/2 to 27	22 to 10 1/2
2 1/2 to 3-in. ..	41 1/2 to 32	25 to 16
3 1/2 to 6-in. ..	43 1/2 to 38 1/2	27 to 22
Wrought Iron, butt weld		
1/2-in.	+20 1/2	+47
3/4-in.	+10 1/2	+36
1 & 1 1/4 in. ..	+4 1/2	+27
2-in.	— 1 1/2	+23 1/2
3-in.	— 2	+23
Wrought Iron, lap weld		
2-in.	+7 1/2	+31
2 1/2 to 3 1/2-in. .	+5	+26 1/2
4-in.	list	+20 1/2
4 1/2 to 8-in.	+2	+22

EXTRA STRONG, PLAIN ENDS

Steel, butt weld		
1/2-in.	42 to 40	26 to 24
3/4-in.	46 to 44	30 to 28
1-in.	48 to 46	33 to 31
1 1/4-in.	48 1/2 to 46 1/2	33 1/2 to 31 1/2
1 1/2-in.	49 to 47	34 to 32
2-in.	49 1/2 to 47 1/2	34 1/2 to 33 1/2
2 1/2 to 3-in. ..	50 to 48	35 to 33
Steel, lap weld		
2-in.	39 1/2 to 38 1/2	24 to 23
2 1/2 to 3-in. ..	44 1/2 to 42 1/2	29 to 27
3 1/2 to 6-in. ..	48 to 44	32 1/2 to 30 1/2
Steel, seamless		
2-in.	37 1/2 to 32 1/2	22 to 17
2 1/2 to 3-in. ..	41 1/2 to 36 1/2	26 to 22
3 1/2 to 6-in. ..	45	29 1/2
Wrought Iron, butt weld		
1/2-in.	+16	+40
3/4-in.	+9 1/2	+34
1 to 2-in.	— 1 1/2	+23
Wrought Iron, lap weld		
2-in.	+4 1/2	+27 1/2
2 1/2 to 4-in.	+5	+16
4 1/2 to 6-in.	— 1	+20 1/2

For threads only, butt weld, lap weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt weld, lap weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap weld and seamless 3 1/2-in. and larger four points higher discount (lower price) applies. On butt weld and lap weld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut length 4 to 24 ft inclusive.	OD	Gage	Seamless	Electric Weld
In in. BWG H.R. C.R. H.R. C.D.				
2 13	\$19.18	\$22.56	\$18.60	\$21.89
2 1/2 12	25.79	30.33	25.02	29.41
3 12	28.68	33.76	27.82	32.74
3 1/2 11	35.85	42.20	34.78	40.94
4 10	44.51	52.35	43.17	50.78

CAST IRON WATER PIPE

Per net ton	
6 to 24-in., del'd Chicago	\$95.70
6 to 24-in., del'd N. Y.	\$92.50 to 97.40
6 to 24-in., Birmingham	82.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	109.30
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

	Pct Off List
1/2 in. & smaller x 6 in. & shorter	35
9/16 & 5/8 in. x 6 in. & shorter	37
3/4 in. & larger x 6 in. shorter	34
All diam., longer than 6 in.	30
Lag, all diam over 6 in. longer	35
Lag, all diam x 6 in. & shorter	37
Plow bolts	47

Nuts, Cold Punched or Hot Pressed (Hexagon or Square)

1/2 in. and smaller	35
9/16 to 1 in. inclusive	34
1 1/8 to 1 1/2 in. inclusive	32
1 1/2 in. and larger	27
On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.	

Semifinished Hexagon Nuts

	USS	SAE
7/16 in. and smaller	38	41
1/2 in. and smaller	38	39
1/2 in. through 1 in.	37	37
9/16 in. through 1 in.	35	37
1 1/8 in. through 1 1/2 in.	28	37
1 1/2 in. and larger	28	37
In full case lots, 15 pct additional discount.		

Stove Bolts

Packages, nuts separate	\$61.75
In bulk	70.00

Large Rivets

	(1/2 in. and larger)
	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	\$6.75
F.o.b. Lebanon, Pa.	6.75

Small Rivets

	(7/16 in. and smaller)
	Pct off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	48

Cap and Set Screws (In packages)

	Pct Off List
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	46
3/4 to 1 in. x 6 in., SAE (1035), heat treated	35
Milled studs	19
Flat head cap screws, listed sizes	5
Fillister head cap, listed sizes	28

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill.

Effective CaF ₂ Content:	Base price per net ton
70% or more	\$37.00
60% or less	34.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per gross Ton
Old range, bessemer	\$7.60
Old range, nonbessemer	7.45
Mesabi, bessemer	7.35
Mesabi, nonbessemer	7.20
High phosphorus	7.20
After Dec. 31, 1948, increases or decreases in Upper Lake freight, dock and handling charges and taxes thereon to be for the buyers' account.	

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f.	7.9¢ to 9.0¢
New York, ocean bags	
Domestic sponge iron, 98+%	9.0¢ to 15.0¢
Fe, carload lots	
Electrolytic iron, annealed	31.5¢ to 39.5¢
99.5+% Fe	
Electrolytic iron, unannealed, minus 325 mesh, 99+%	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+%	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 microns, 98%, 99.8+%	90.0¢ to \$1.75
Aluminum	30.00 to 31.00¢
Antimony	51.17¢
Brass, 10 ton lots	22.75 to 25.75¢
Copper, electrolytic	28.125¢
Copper, reduced	28.00¢
Cadmium	\$2.40
Chromium, electrolytic, 99% min.	\$3.50
Lead	20.22¢
Manganese	55.00 to 60.00¢
Molybdenum, 99%	\$2.65
Nickel, unannealed	66.00¢
Nickel, spherical, minus 30 mesh, unannealed	68.00¢
Silicon	34.00¢
Solder powder	8.5¢ plus metal cost
Stainless steel, 302	75.00¢
Tin	\$1.25
Tungsten, 99%	\$2.90
Zinc, 10 ton lots	14.75 to 16.25¢

COKE

Furnace, beehive (f.o.b. oven)	Net Ton
Connellsville, Pa.	\$14.00 to \$14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$16.00 to \$16.50
Foundry, oven coke	
Buffalo, del'd	\$22.95
Chicago, f.o.b.	20.40
Detroit, f.o.b.	19.40
New England, del'd	22.70
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	20.45
Swedeland, Pa., f.o.b.	20.40
Plainsville, Ohio, f.o.b.	20.90
Erie, del'd	\$21.50 to 23.50
Cleveland, del'd	22.45
Cincinnati, del'd	21.50
St. Paul, f.o.b.	23.50
St. Louis, del'd	20.98
Birmingham, del'd	18.66

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick	Carloads, Per 1000
First quality, Pa., Md., Ky., Mo., Ill. (except Salina, Pa., add \$5)	\$80.00
No. 1 Ohio	74.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	74.00
No. 2 Ohio	66.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	11.50
Silica Brick	
Mt. Union, Pa., Ensley, Ala.	\$80.00
Childs, Pa.	84.00
Hays, Pa.	85.00
Chicago District	89.00
Western, Utah and Calif.	95.00
Super Duty, Hays, Pa., Athens, Tex.	85.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	\$13.75 to 14.00
Silica cement, net ton, bulk, Hays, Pa.	16.00
Silica cement, net ton, bulk, Ensley, Ala.	15.00
Silica cement, net ton, bulk, Chicago District	14.75
Silica cement, net ton, bulk, Utah and Calif.	21.00

Chrome Brick	Per Net Ton
Standard chemically bonded, Balt., Chester	\$69.00
Magnesite Brick	
Standard, Balt. and Chester	\$91.00
Chemically bonded, Balt. and Chester	80.00

Grain Magnesite	Std. 3/4-in. grains
Domestic, f.o.b. Balt. and Chester, in bulk, fines removed	\$56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines	\$30.50 to 31.00
in sacks with fines	35.00 to 35.50
Dead Burned Dolomite	
F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk, Midwest, add 10¢; Missouri Valley, add 20¢	\$12.25

PRICES

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 15¢ to base price except Cincinnati and New Orleans (*), add 10¢; New York, add 20¢.)

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Baltimore.....	5.31	6.21-	6.95-	5.37	....	5.56	5.38	5.42	6.16	....	9.60-	....	....
Birmingham.....	5.05	6.41	7.11	5.05	6.68	5.25	5.00	5.00	6.68	....	10.10	....	....
Boston.....	5.55	6.45-	7.11-	5.60-	6.75	5.80	5.42	5.52	6.27	9.67-	10.04-	11.23	11.47
Buffalo.....	4.85	6.75	7.61	5.95	7.27	5.35	5.10	5.05-	5.90	9.79	10.07	11.15	11.40-
Chicago.....	4.85	5.75	7.43-	5.30	7.27	5.35	5.10	5.15	5.90	9.60-	9.85-	11.15	11.40-
Cincinnati*.....	5.16-	5.84-	6.59-	4.85	5.55-	5.10	4.90	5.15	5.70	9.70	9.95	10.25	10.55
Cleveland.....	5.51	6.28	7.10	5.28-	6.68	5.53-	5.33	5.33	6.08-	9.74	9.99	11.19	11.44
Detroit.....	4.85	5.75	6.59	5.43	....	5.85	5.48	5.48	6.20	9.79	10.07	11.23	11.47
Houston.....	5.16	6.06	6.81-	5.03-	....	5.21-	5.01-	5.01-	5.70-	9.49-	9.74-	10.95	11.19-
Indianapolis.....	5.28	6.07-	7.35-	5.15	6.27-	5.54	5.47	5.34	5.97	9.50	9.75	11.11	11.20
Los Angeles.....	5.32	6.18	7.58	5.27-	6.58	5.52-	5.33-	5.33-	6.00-	9.67	9.92	11.11	11.35
Memphis.....	6.70-	....	7.30	5.87	....	5.87	5.40	5.55	6.10	....	....	....	....
Milwaukee.....	6.95	....	....	6.70	....	6.70	6.20-	6.40-	7.60	10.45	10.40	11.45	11.70
New Orleans*.....	5.29	6.13	7.44	5.29	7.36	5.84	5.34	5.34	6.14	11.25	11.39	....	....
New York.....	6.45	7.80 ¹⁹ -	8.05	6.65	8.35 ⁵	6.15	5.95	6.10	7.95 ¹⁴	10.95 ¹⁵	10.90 ¹⁵ -	12.45 ¹⁵	12.70 ¹⁵ -
Norfolk.....	5.75-	6.60	7.20	5.80-	6.80	5.95-	5.75	5.75	6.53	....	....	....	16.45 ¹
Omaha.....	5.80	....	....	5.95	....	6.00	5.75	5.75	6.53	....	....	....	....
Philadelphia.....	5.03	5.93	7.13-	5.03-	6.86	5.28	5.08	5.08	5.88	9.53	9.78	10.98	11.23
Pittsburgh.....	5.95	6.75	7.18	5.38	....	6.15	5.95	5.95	6.65 ⁶	....	....	....	....
Portland.....	5.40	6.31-	7.00	5.62-	....	5.70	5.33	5.57	6.36-	9.73	9.98	11.18	11.43
Salt Lake City.....	6.00	6.46	....	5.72	....	6.05	6.05	6.05	6.41	....	....	....	....
San Francisco.....	6.13	....	8.33	6.13	....	6.38	6.18	6.18	7.05	....	....	....	....
Seattle.....	5.08	6.24 ¹³	6.73	5.45	6.69	5.38	5.10	5.40	6.19	9.70	9.75	10.95	11.20
St. Louis.....	4.85	5.75 ¹	6.95-	5.00	6.00	5.05	4.90	4.90	5.65	9.35	9.60	10.80	11.05
St. Paul.....	6.50 ⁸ -	8.00 ¹	7.32	6.85 ⁸	....	5.10	4.90	4.90	5.65	9.35	9.60	10.80	11.05
	6.90	8.00 ¹	8.80-	6.85 ⁸	....	6.30 ⁸	6.35 ⁸	6.35 ⁸	8.25 ¹⁴	10.50 ⁶	10.10 ⁶	....	....
	7.25 ³	8.20	9.10	7.65 ³	....	6.10 ³	5.70 ³	6.95 ⁸	8.30	....	....	....	....
	6.15 ⁸ -	7.50 ²	7.90	6.75 ⁸	8.25 ⁵	6.30-	5.90 ⁸	5.90 ⁸	7.55	10.90 ¹⁵	10.85 ¹⁵	12.40 ¹⁵	12.65 ¹⁵
	7.15	8.15 ² -	8.80	6.70 ⁴	....	6.35 ⁸	6.30 ⁴	6.20 ⁴	8.15 ¹⁴	....	10.35 ¹⁵	....	13.10 ¹⁵
	6.70 ⁴ -	8.15 ² -	8.80	6.70 ⁴	....	6.35 ⁸	6.30 ⁴	6.20 ⁴	8.15 ¹⁴	....	10.35 ¹⁵	....	13.10 ¹⁵
	7.10	8.65	9.30	6.70 ⁴	....	6.35 ⁸	6.30 ⁴	6.20 ⁴	8.15 ¹⁴	....	10.35 ¹⁵	....	13.10 ¹⁵
	5.22-	6.12 ¹ -	7.32	5.22	6.68-	5.47	5.27	5.27	6.07-	9.27-	9.57-	10.62-	10.92-
	5.37	6.27	7.54	5.44	6.82	5.64-	5.49	5.49	6.22	9.72	9.97	11.17	11.42
	5.44	6.19-	7.54-	5.44	6.82	5.64-	5.49	5.49	6.29	9.49	9.79	10.84	11.14
	6.34	7.64	....	5.44	6.82	5.64-	5.49	5.49	6.29	9.49	9.79	10.84	11.14

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED:

Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED:

Sheets, 400 to 1499 lb strip, extras on all quantities bars 1000 lb and over.

ALLOY BARS:

1000 to 1999 lb.

GALVANIZED SHEETS:

450 to 1499 lb.

EXCEPTIONS:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb; (18) 1000 to 1499 lb; (19) 1500 to 3499 lb.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight nor the 6 pct increase on total freight charges in the Eastern Zone (5 pct Southern Zone, 4 pct Western Zone), effective Jan. 11, 1949.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem.....	48.00	....	....	....	....
Birmingham.....	38.88	39.38	....	....	....
Buffalo.....	46.00	46.50	47.00	....	....
Chicago.....	46.00	46.50	46.50	47.00	....
Cleveland.....	46.00	46.50	46.50	47.00	51.00
Duluth.....	46.00	46.50	46.50	47.00	....
Erie.....	46.00	46.50	46.50	47.00	....
Everett.....	46.00	52.50	53.00	....	....
Granite City.....	47.90	48.40	48.90	....	....
Ironton, Utah.....	46.00	46.50	....	....	....
Lone Star, Texas.....	46.00	46.50	46.50	....	....
Neville Island.....	46.00	46.50	46.50	....	....
Geneva, Utah.....	46.00	46.50	....	....	....
Sharpsville.....	46.00	46.50	46.50	47.00	....
Steelton.....	46.00	46.50	49.00	49.50	54.00
Struthers, Ohio.....	46.00	....	....	....	....
Swedeland.....	46.00	48.50	49.00	49.50	....
Toledo.....	46.00	46.50	46.50	47.00	....
Troy, N. Y.....	46.00	46.50	49.00	....	54.00
Youngstown.....	46.00	46.50	46.50	....	....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Producing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston.....	Everett.....	\$0.50 Arb.	....	52.50	53.00	....	....
Boston.....	Steelton.....	8.27	54.27	54.77	55.27	55.77	60.27
Brooklyn.....	Steelton.....	5.48	....	53.98	54.48	54.98	59.48
Cincinnati.....	Birmingham.....	6.09	44.97	45.47	....	....	....
Jersey City.....	Steelton.....	3.67	....	52.17	52.67	53.17	57.67
Los Angeles.....	Geneva-Ironton.....	7.13	53.13	53.63	....	....	....
Mansfield.....	Cleveland-Toledo.....	3.03	49.03	49.53	49.53	50.03	54.03
Philadelphia.....	Bethlehem.....	2.17	50.17	....	....	....	....
Philadelphia.....	Swedeland.....	1.31	49.31	49.81	50.31	50.81	....
Philadelphia.....	Steelton.....	2.81	50.81	51.31	51.81	52.31	56.81
San Francisco.....	Geneva-Ironton.....	7.13	53.13	53.63	....	....	....
Seattle.....	Geneva-Ironton.....	7.13	53.13	53.63	....	....	....
St. Louis.....	Granite City.....	0.75 Arb.	48.85	49.15	49.65	....	....
Gulf Ports.....	Lone Star, Texas.....	....	50.50	51.00	....	....	....

† Low Phos., Southern Grade.

Producing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess

of 1.00 pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio —\$59.50; f.o.b. Buffalo, \$60.75. Add \$1.00 per ton for each additional 0.50 pct Si up to 17 pct. Add 50¢ per ton for each 0.50 pct

Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferro-silicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus \$66.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, \$73.78. High phosphorus charcoal pig iron is not being produced.

FERROALLOY PRICES

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size.	
F.o.b. Birmingham	\$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	\$172
F.o.b. Johnstown, Pa.	\$174
F.o.b. Sheridan, Pa.	\$172
F.o.b. Etna, Pa.	\$175
\$2.00 for each 1% above 82% Mn, penalty, \$2.15 for each 1% below 78%.	
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.	
Carload, bulk	10.45
Ton lots	12.05
Less ton lots	12.95

Spiegeleisen

Contract prices gross ton, lump, f.o.b.	
16-19% Mn 19-21% Mn	
3% max. Si 3% max. Si	
Palmerton, Pa.	\$64.00
Pgh. or Chicago	\$65.00
	\$66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.	
Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.	
Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.	
Carloads Ton Less	
0.07% max. C, 0.06% P, 90% Mn	25.25 27.10 28.30
0.10% max. C	24.75 26.60 27.80
0.15% max. C	24.25 26.10 27.30
0.30% max. C	23.75 25.60 26.80
0.50% max. C	23.25 25.10 26.30
0.75% max. C	
7.00% max. Si	20.25 22.10 23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.	
Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90
Less ton lots	12.80

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, \$80.00; \$78.50 f.o.b. Niagara Falls; Electric furnace silvery iron is not being produced at Jackson. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50% Mn over 1%.	
---	--

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.	
96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.	
Carload, bulk	6.30
Ton lots	7.90
Less ton lots	8.80

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size, bulk, in carloads, delivered.	
25% Si	18.50
50% Si	11.30
75% Si	13.50
85% Si	14.65
90-95% Si	16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.	
Cast Turnings Distilled	
Ton lots	\$2.05 \$2.95 \$3.75
Less ton lots	2.40 3.30 4.55

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si)	
0.06% C	28.75
0.10% C	28.25
0.15% C	28.00
0.20% C	27.75
0.50% C	27.50
1.00% C	27.25
2.00% C	27.00
65-69% Cr, 4-9% C	20.50
62-66% Cr, 4-6% C, 6-9% Si	21.35
Briquets—Contract price, cents per pound of briquet, delivered, 60% chromium.	
Carload bulk	13.75
Ton lots	15.25
Less ton lots	16.15

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.	
--	--

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.	
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.	
Carloads	21.60
Ton lots	23.75
Less ton lots	25.25
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.	
Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, cents per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.	
0.20% max. C	1.09
0.50% max. C	1.05
9.00% min. C	1.04

Calcium—Silicon

Contract price per lb of alloy, lump, delivered.	
30-33% Ca, 60-65% Si, 3.00% max. Fe.	
Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.	
16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.	
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.	
Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.	
Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.	
Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11% Ca 5 to 7%.	
Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.	
Ton lots	17.25
Less ton lots	18.50

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	\$2.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained, V.	
Openhearth	\$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Vanadium pentoxide, 88-92% V ₂ O ₅ contract basis, per pound contained V ₂ O ₅	\$1.20
Ferrocolumbium, 50-60% contract basis, delivered, per pound contained Cb.	
Ton lots	\$2.90
Less ton lots	2.95
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	\$1.10
Calcium molybdate, 45-50%, f.o.b. Langeloth, Pa., per pound contained Mo.	96¢
Molybdenum oxide briquets, f.o.b. Langeloth, Pa.; bags, f.o.b. Wash., Pa., per pound contained Mo.	95¢
Ferrotitanium, 40%, regular grade, 10% C max., f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	\$1.28
Ferrotitanium, 25%, low carbon, f.o.b. Niagara Falls, N.Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	\$1.40
Less ton lots	1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, carloads per net ton	\$160.00
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton	\$65.00
10 tons to less carload	75.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per pound of alloy.	
Carload, bulk	6.60¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.40¢
Ton lots	8.80¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk	11.00¢
Ton lots, packed	11.25¢
Less ton lots	11.75¢
Boron Agents	
Contract prices per lb. of alloy, del.	
Ferroboration, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lot	\$1.20
F.o.b. Wash., Pa.; 100 lb and over	
10 to 14% B.	.75
14 to 19% B.	1.20
19% min. B.	1.50
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	\$1.67
Less ton lots	1.79
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	\$1.80
Silcaz, contract basis, delivered	
Ton lots	45.00¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b. Suspension Bridge, N. Y.; freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	8.625¢
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	\$6.25